

FIG. 1A

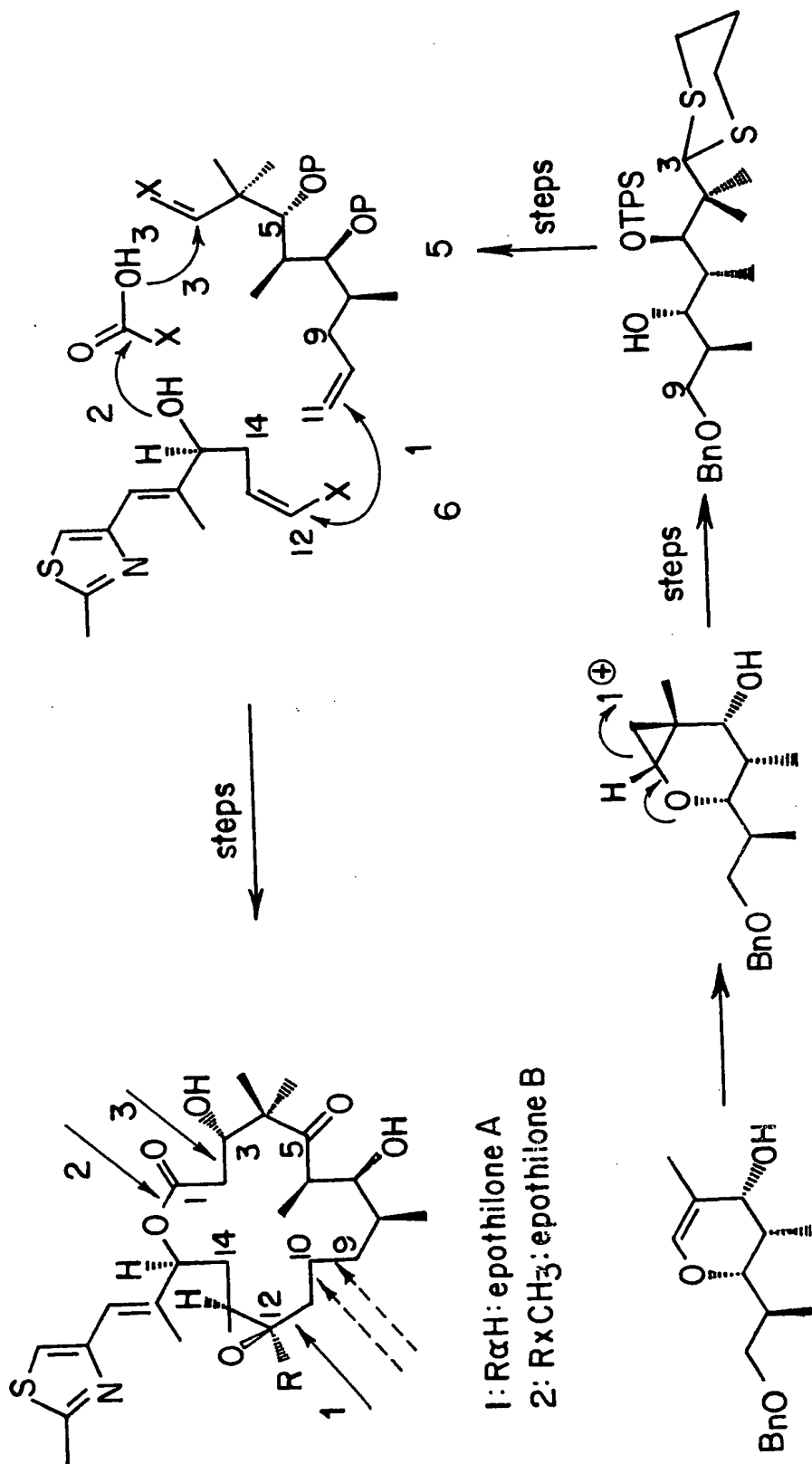
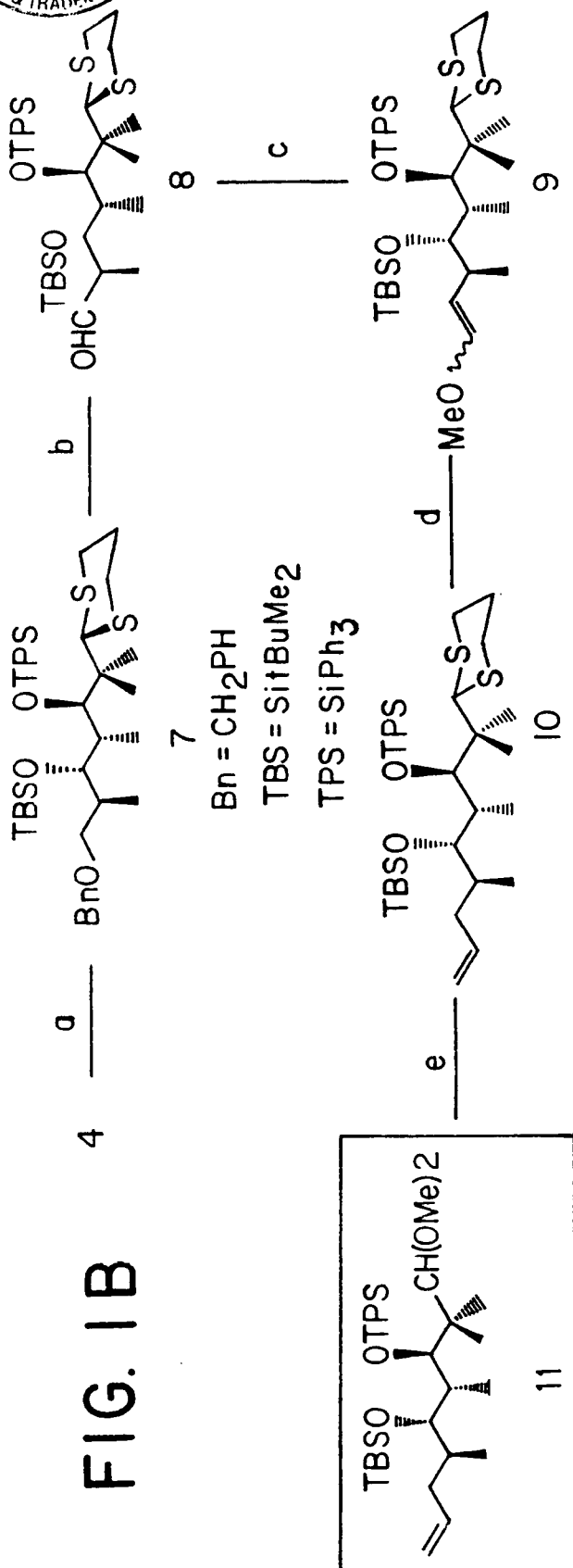
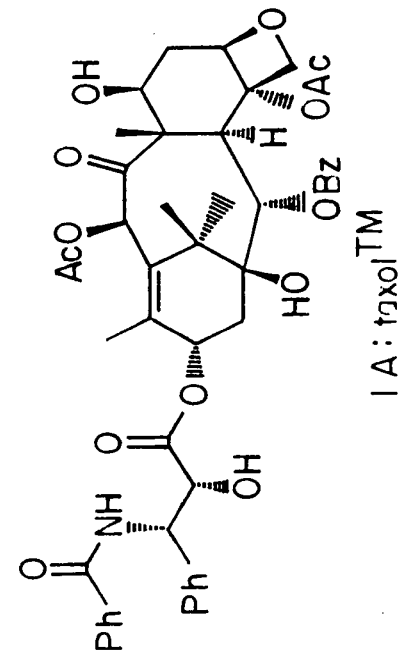


FIG. 1B



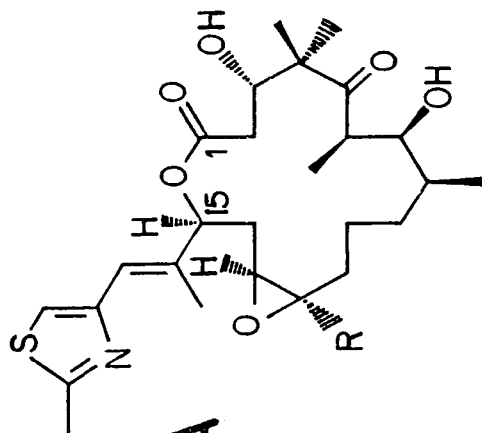
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FIG. 12B



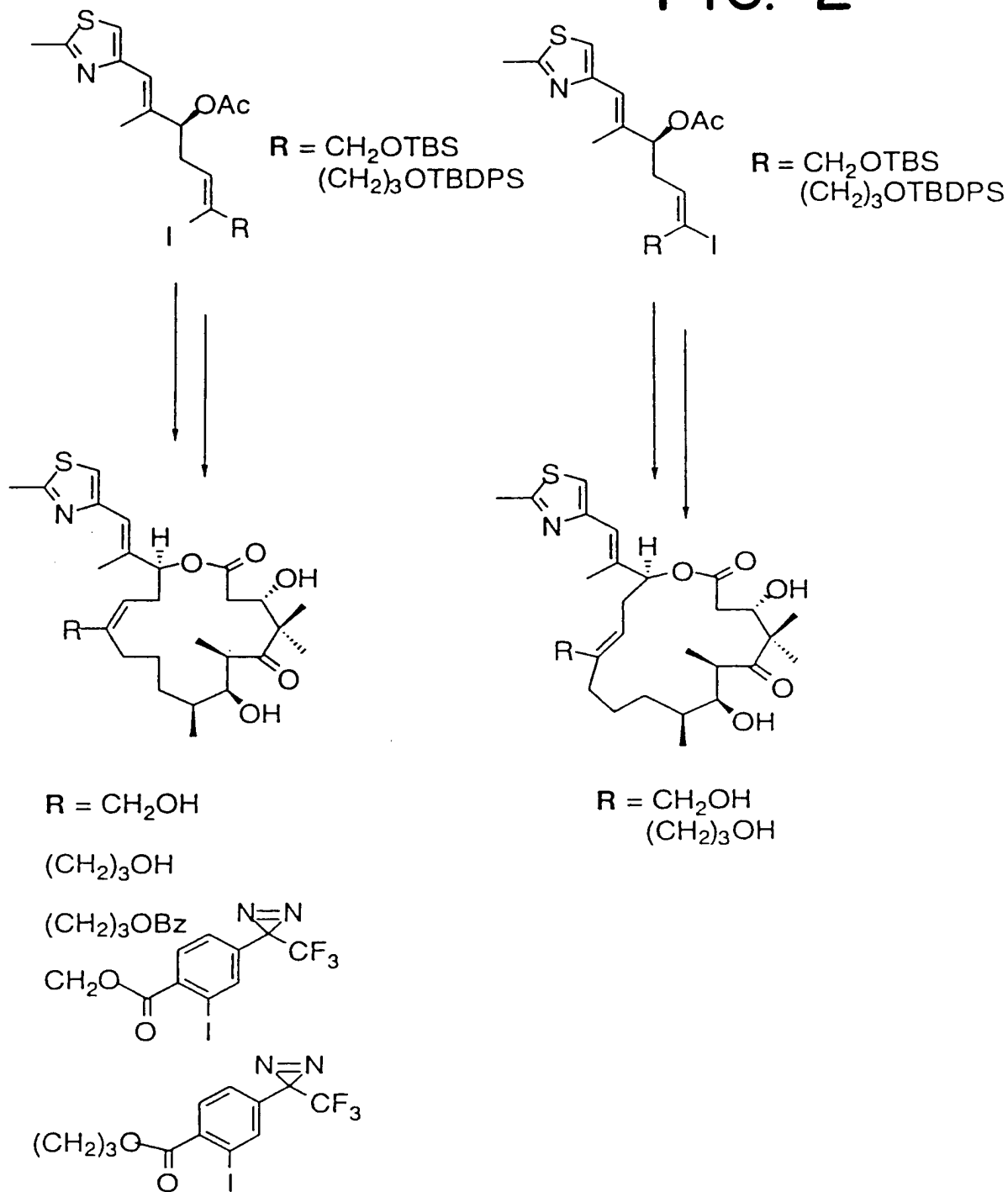
1A: trixol™

FIG. 12A



R = H: epothilone A
R = CH3: epothilone B

FIG. 2



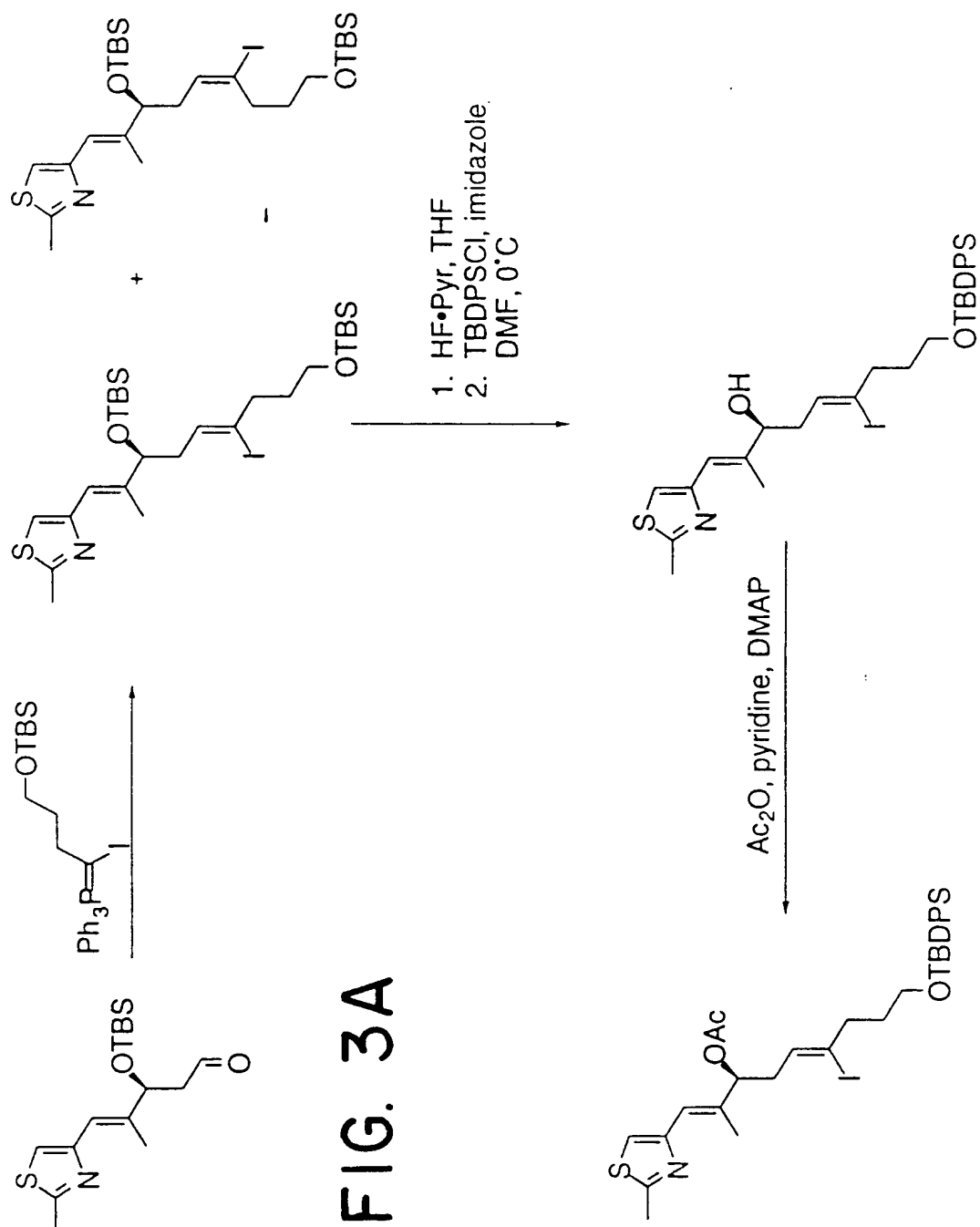


FIG. 3B

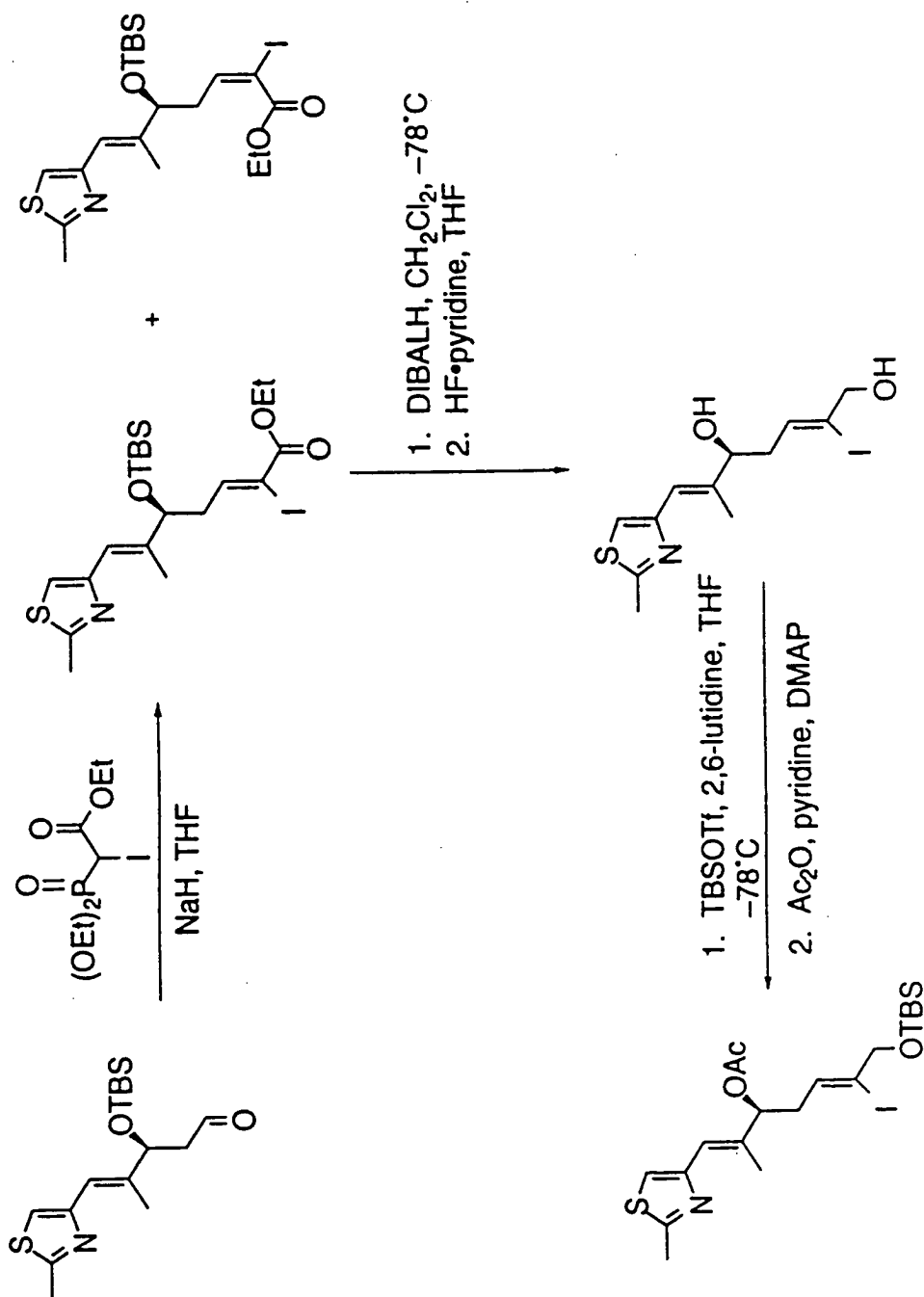
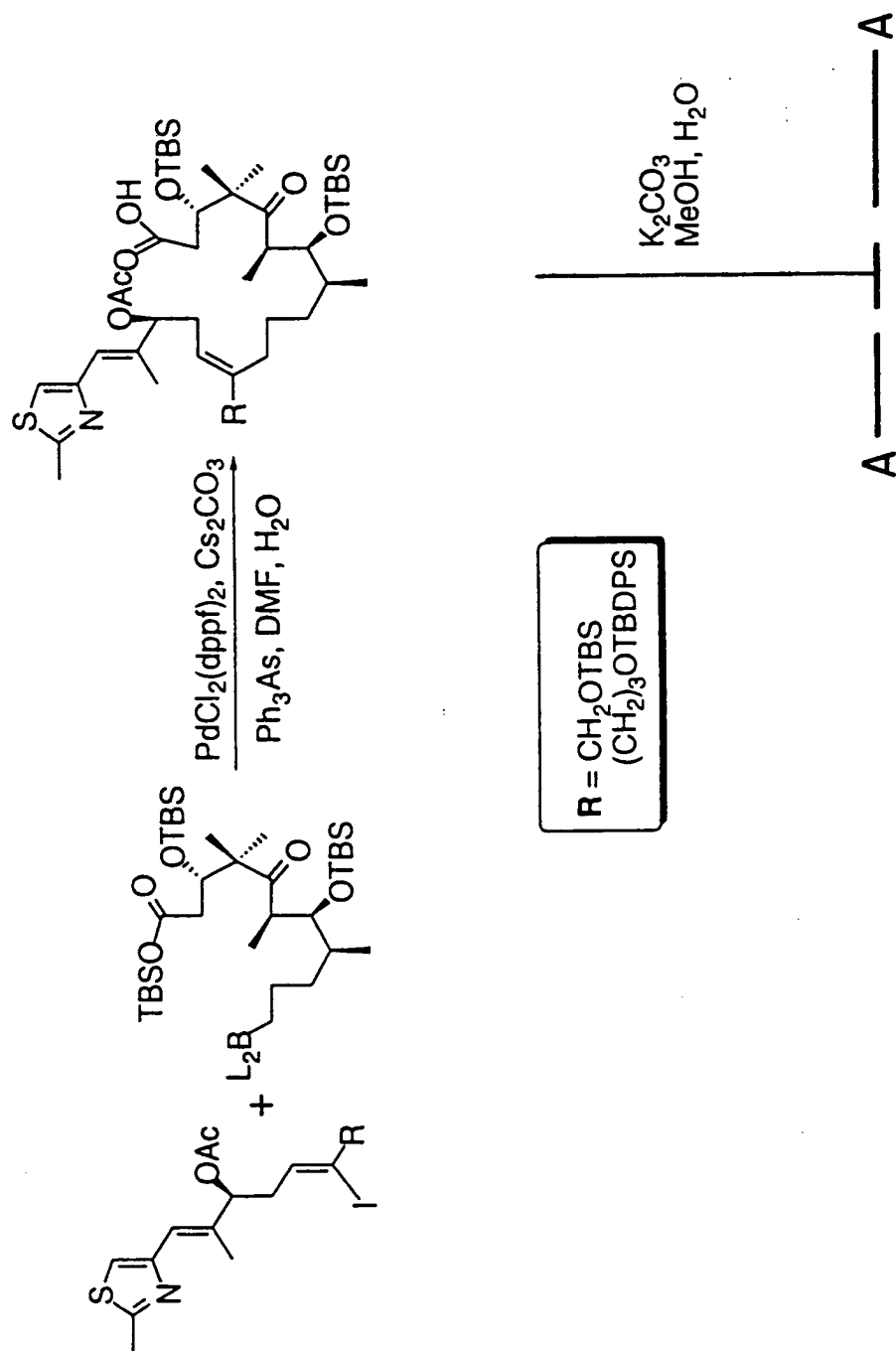
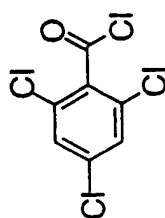
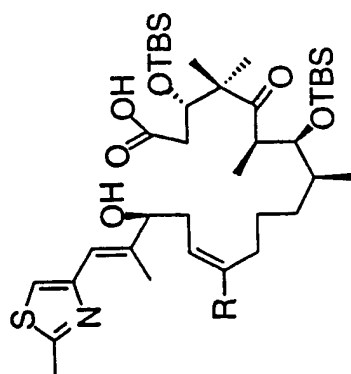


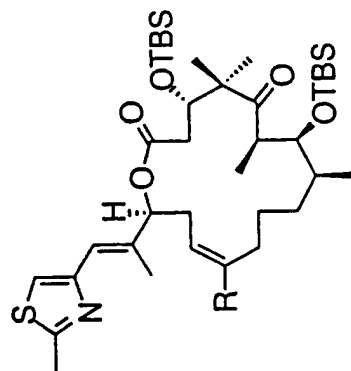
FIG. 3C



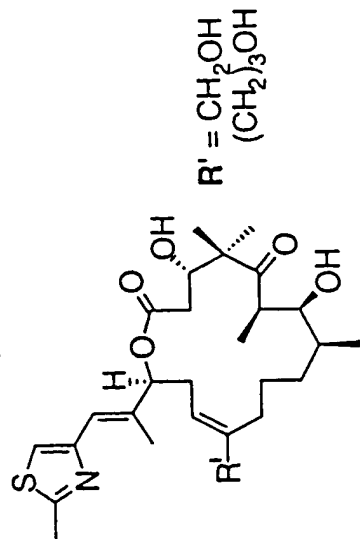
A ——— T ——— A



TEA, 4-DMAP, C₆H₆



HF•pyridine
THF, 25°C



R' = CH₂OH
(CH₂)₃OH

FIG. 3D

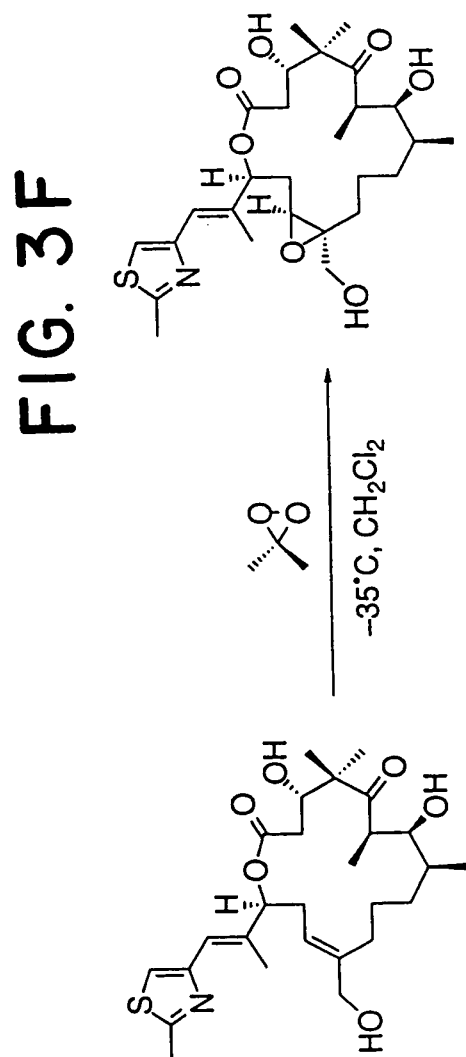
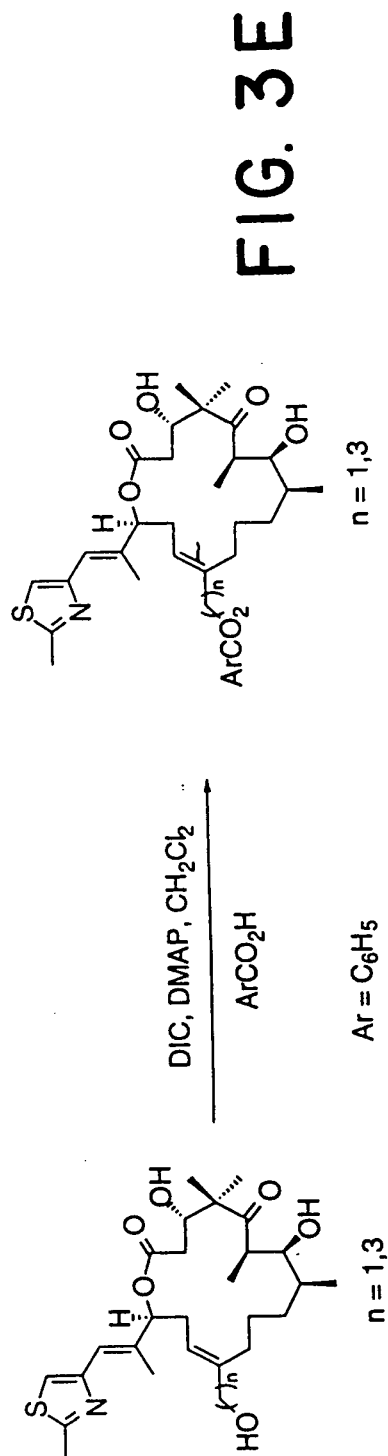
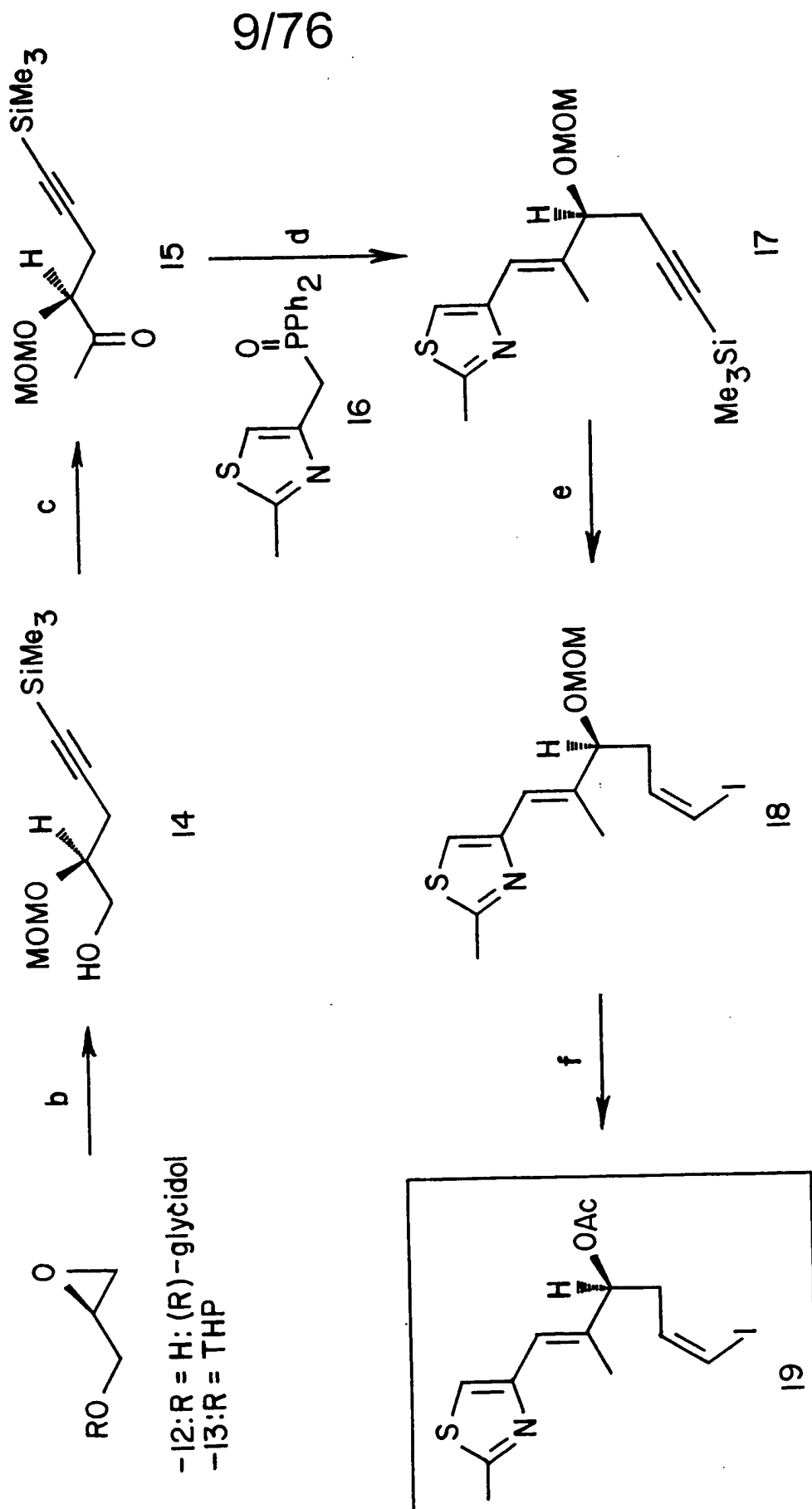


FIG. 4A



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FIG. 4B

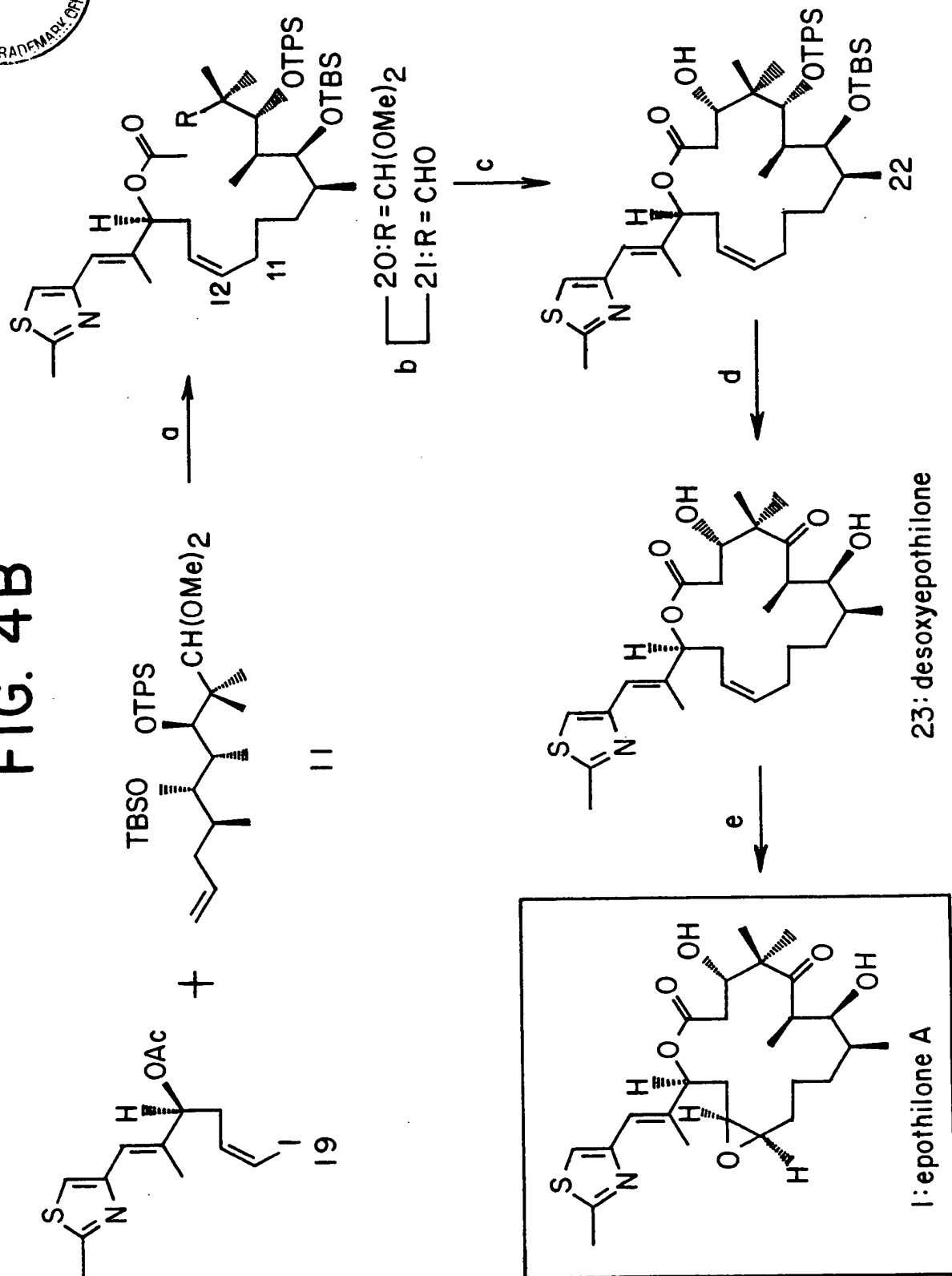
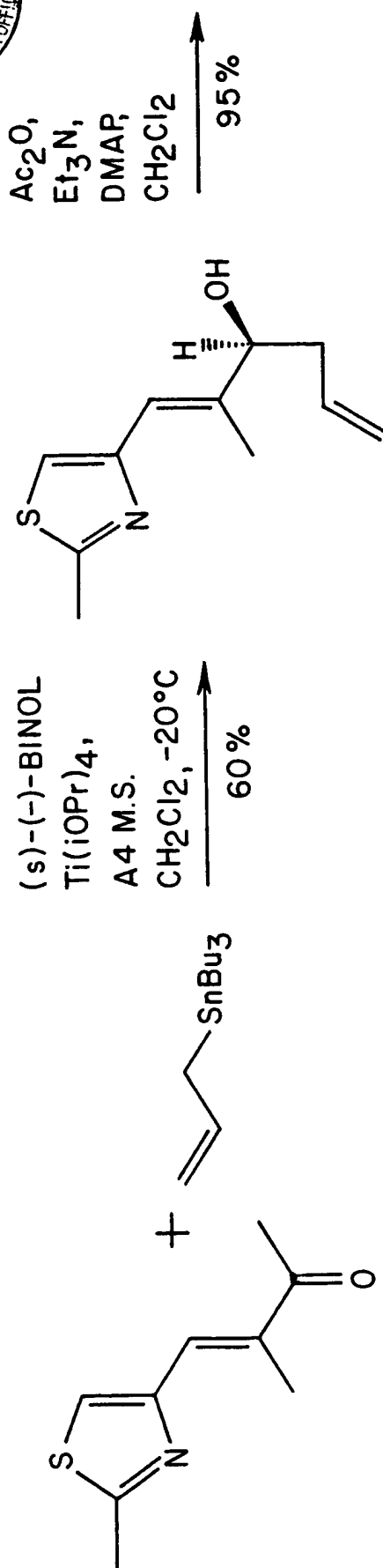




FIG. 5



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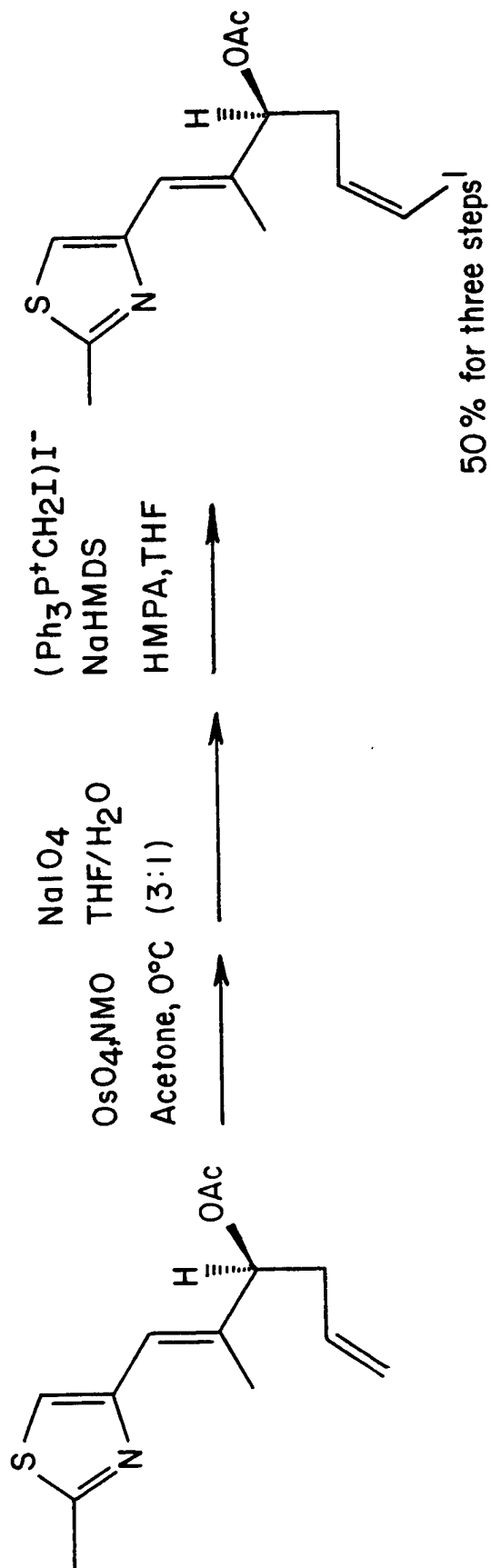


FIG. 6A

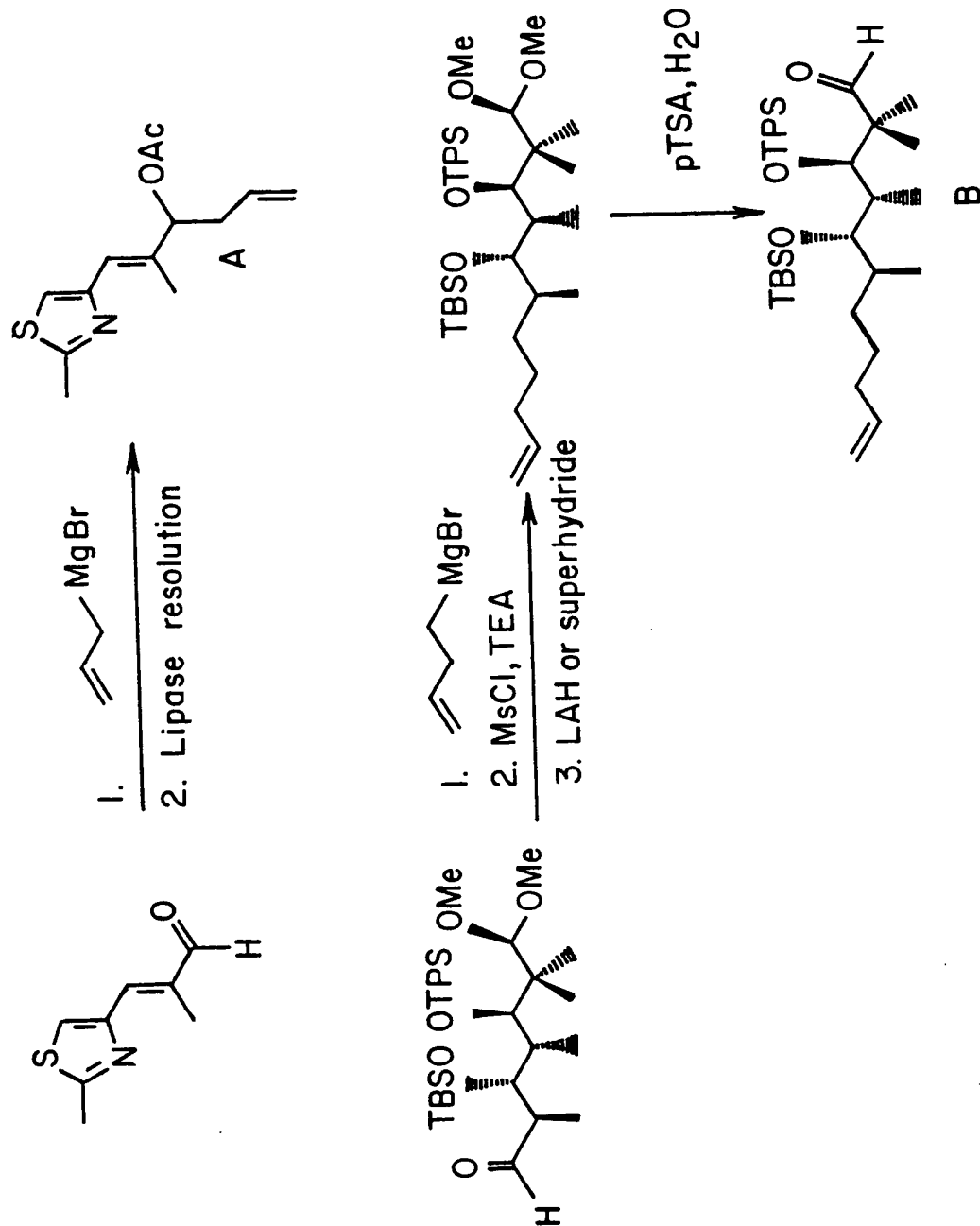
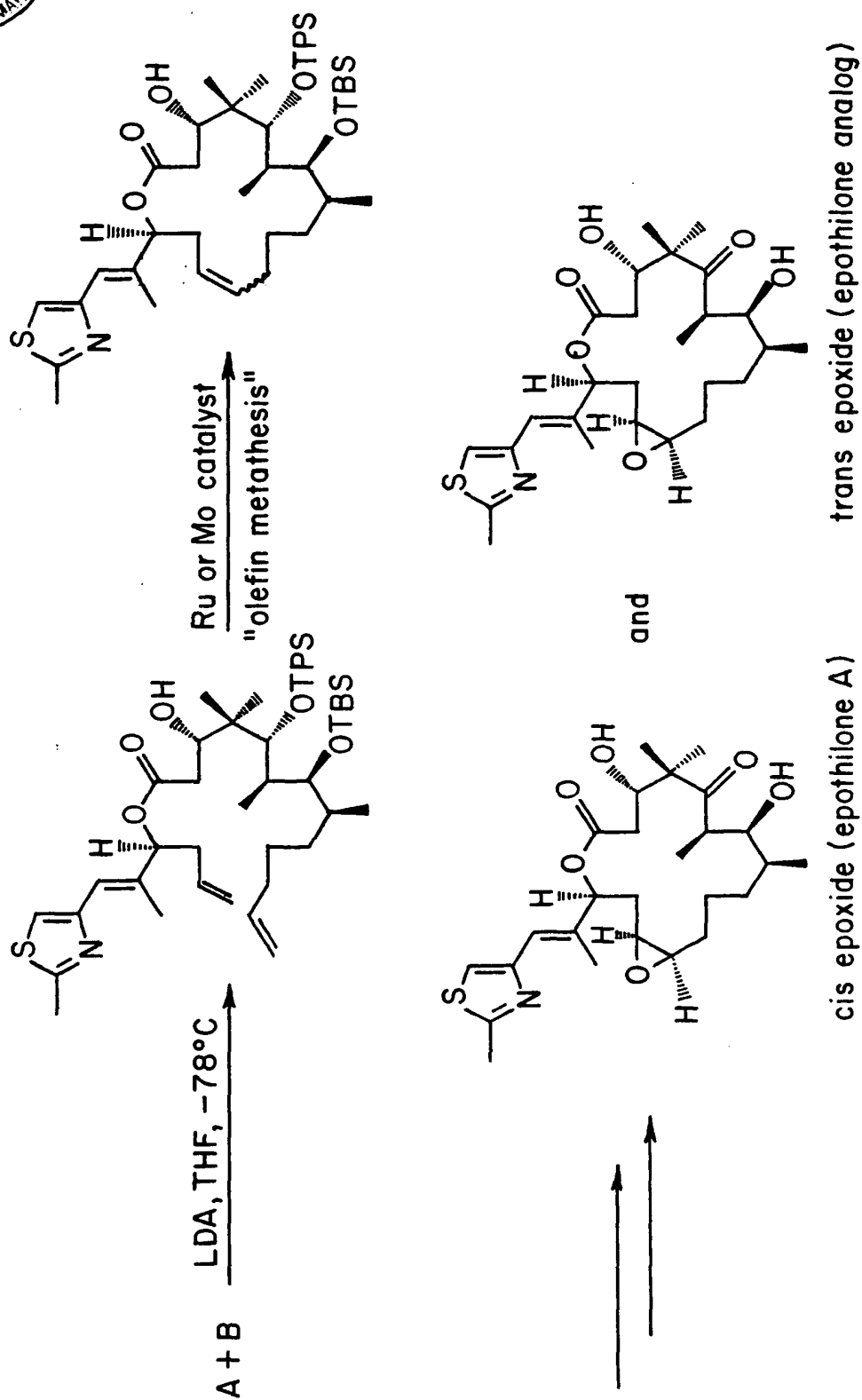


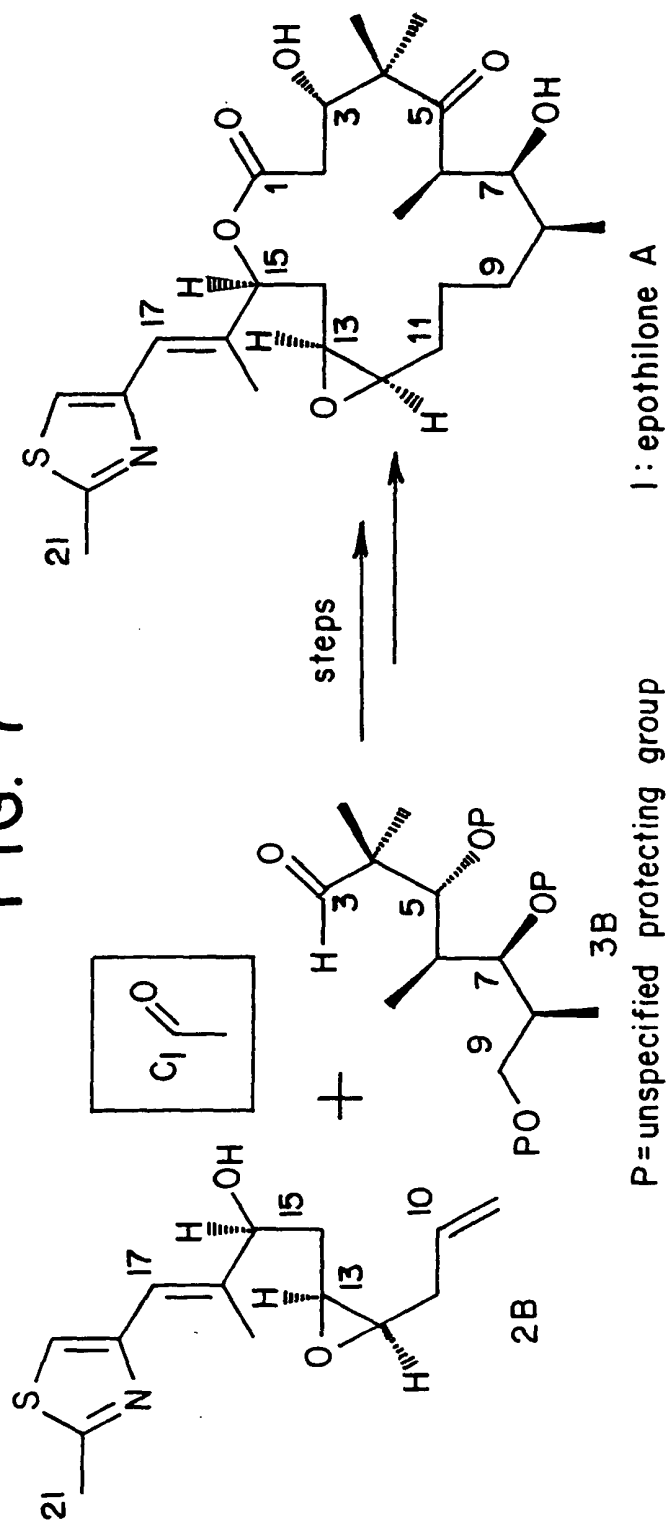
FIG. 6B



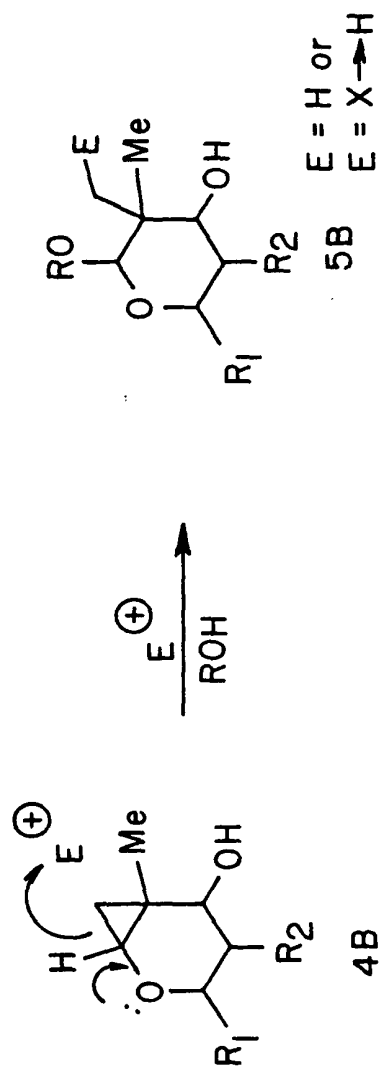
*17 steps from known starting materials vs. 27 steps for aldol macrocyclization

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FIG. 7



Convergent strategy for a total synthesis of epothilone A (1).



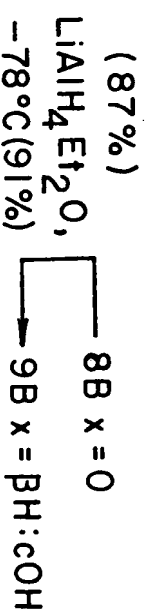
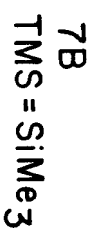
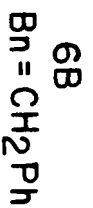
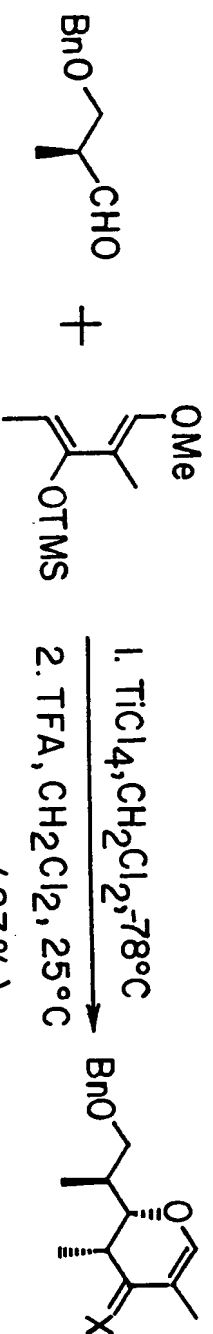


FIG. 8

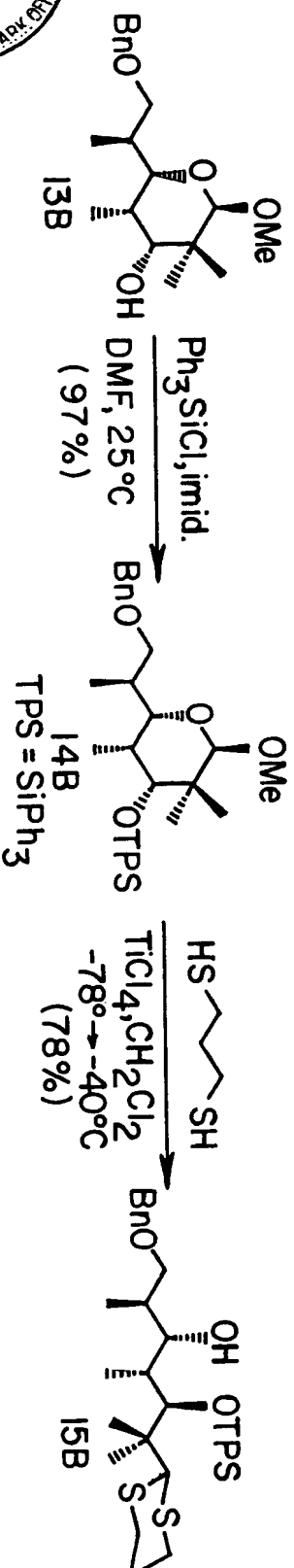
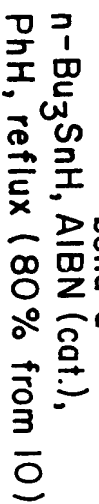
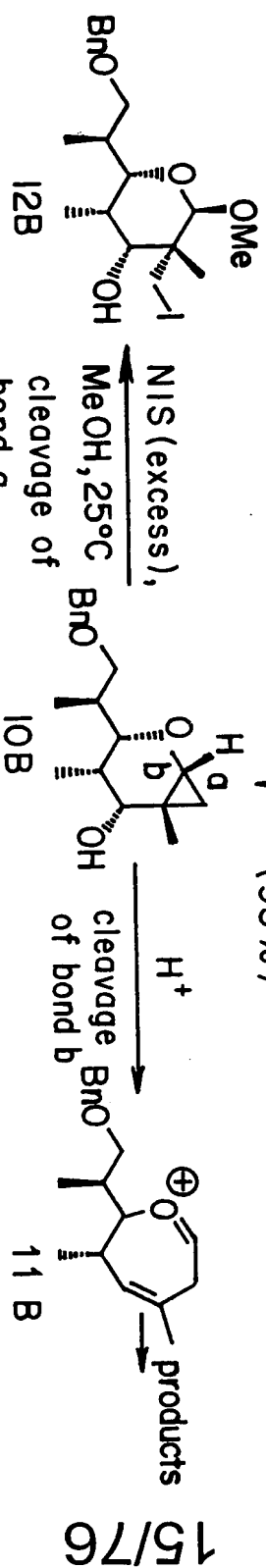
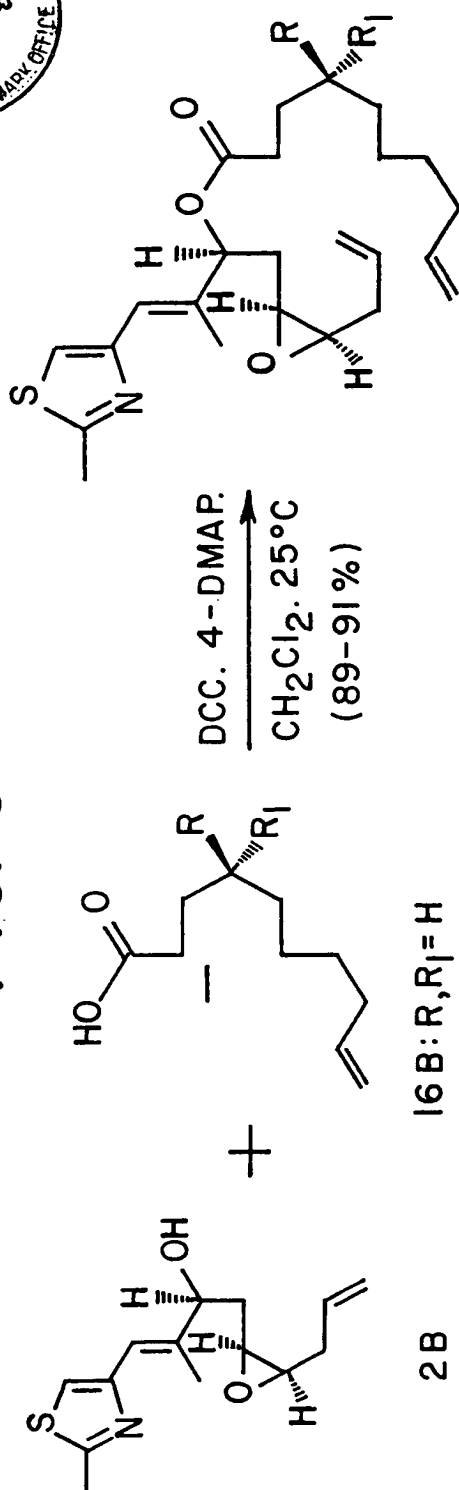


FIG. 9



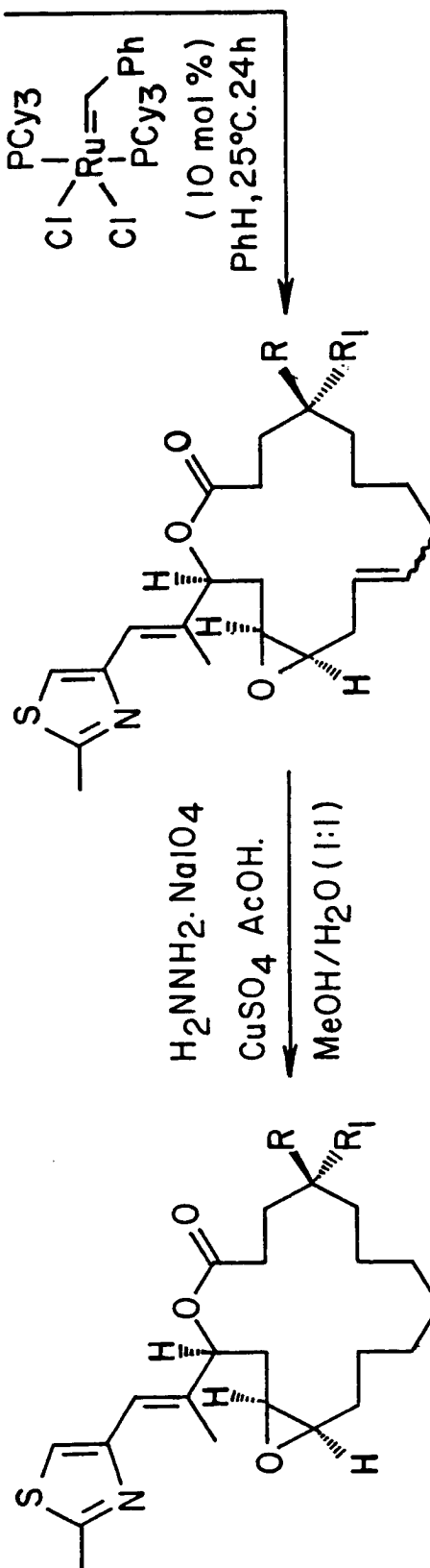
16B: R, R₁ = H
17B: R, R₁ = CH₃

2B

18B: R, R₁ = H

19B: R, R₁ = CH₃

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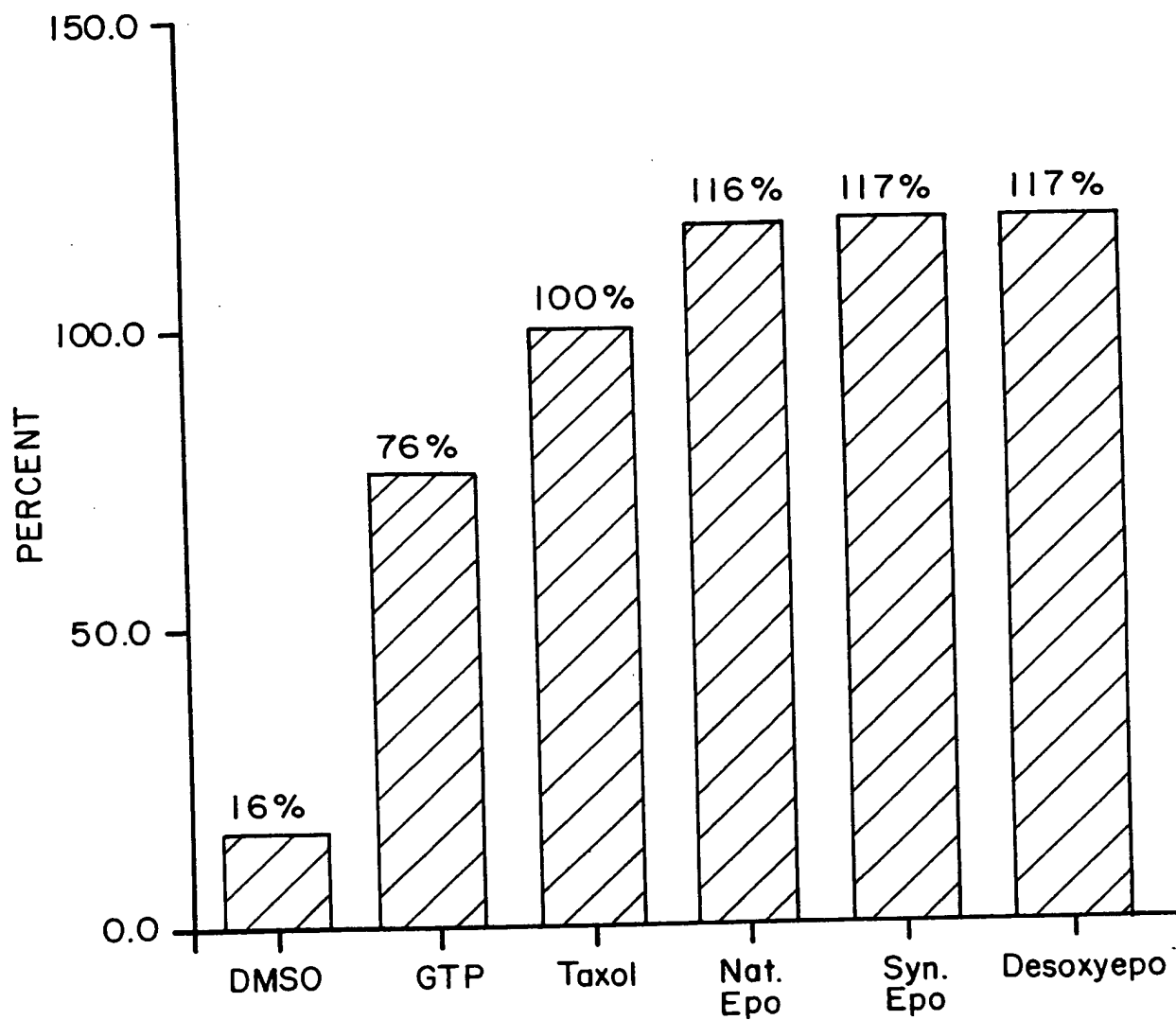
20B: R, R₁ = H (E:Z ca. 1:1, 45%)
21B: R, R₁ = CH (one stereoisomer, 70%)

22B: R, R₁ = H



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FIG. 10





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FIG. 11

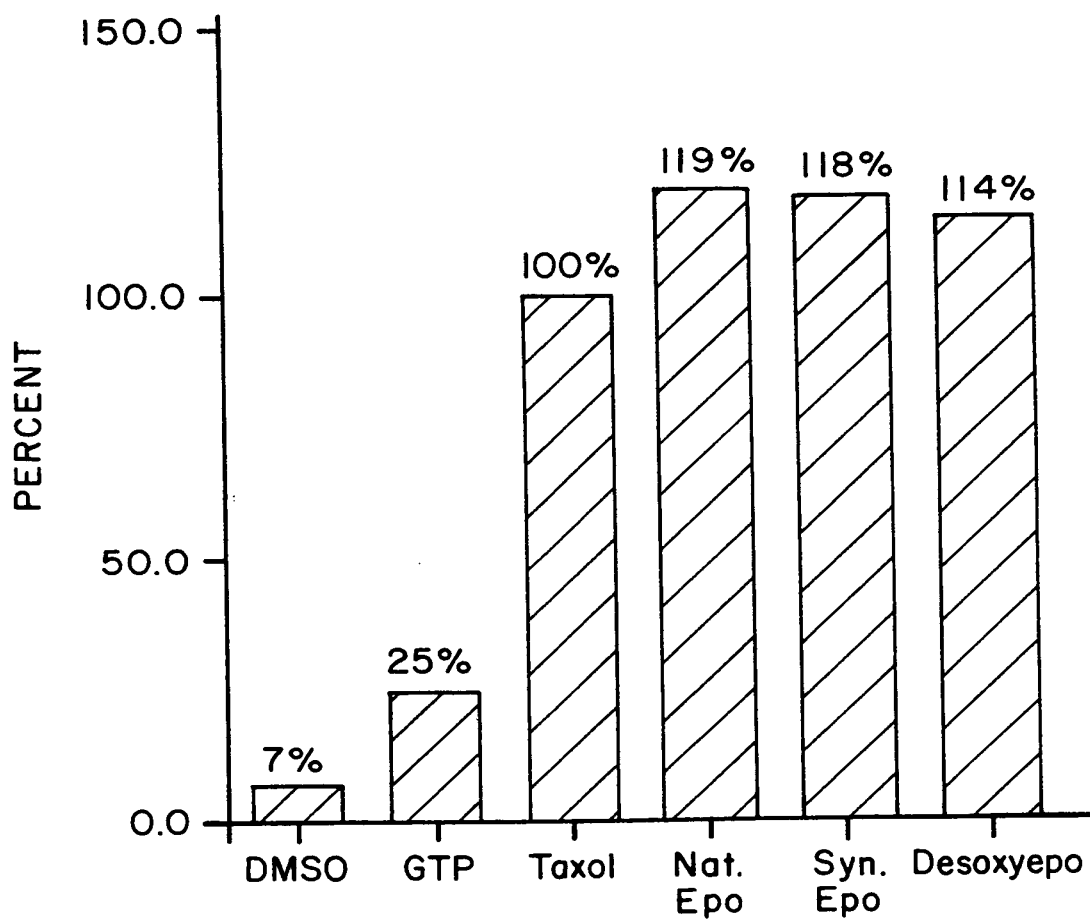


FIG. 13

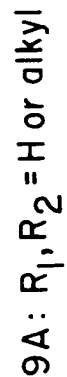


FIG. 14A

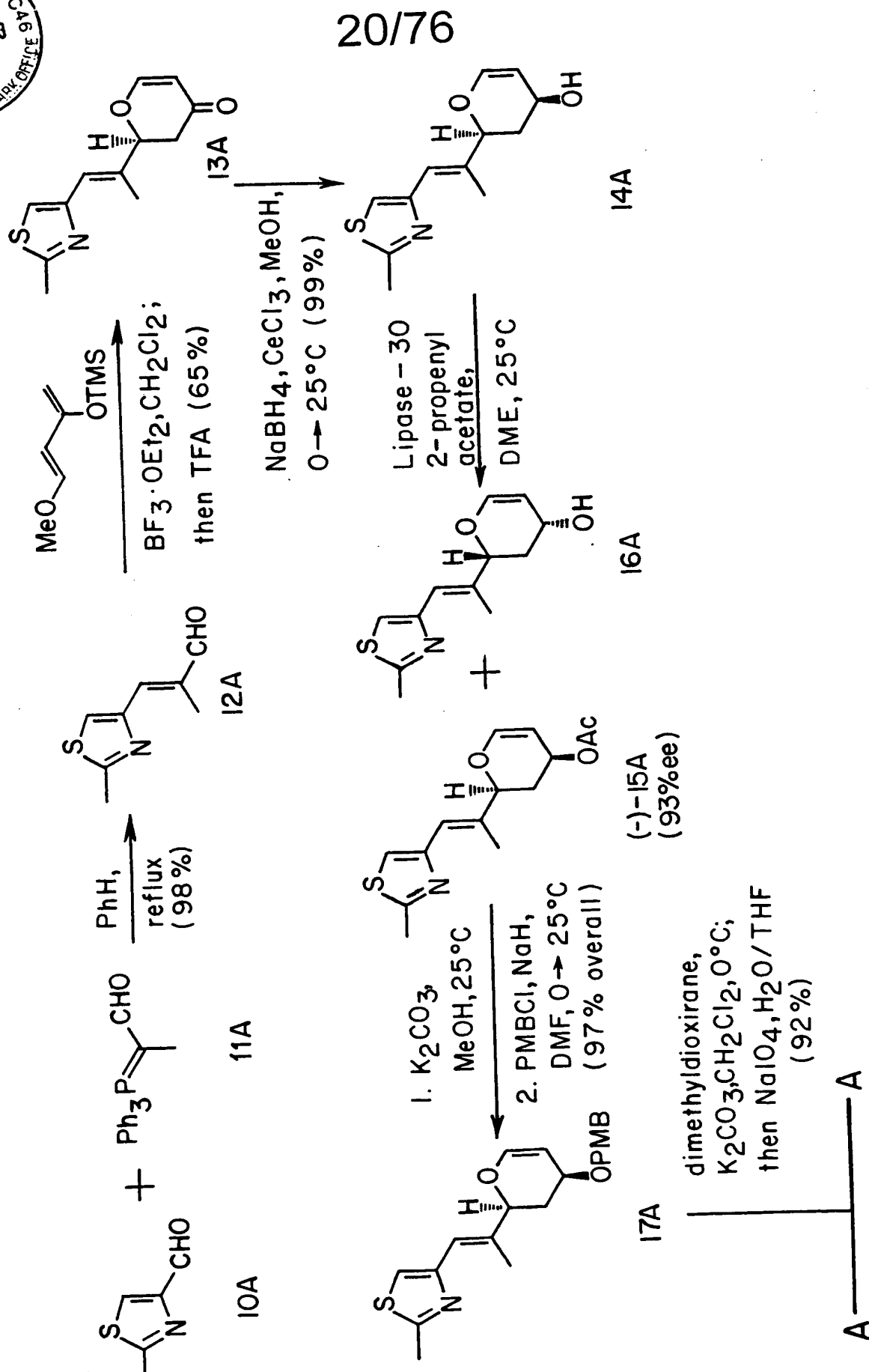


FIG. 14B

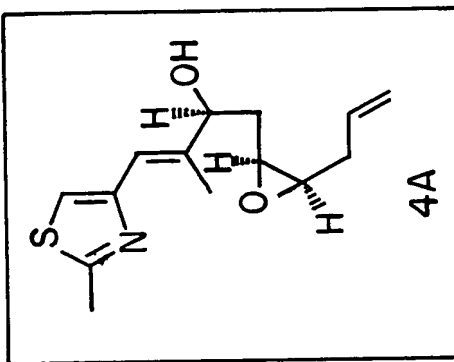
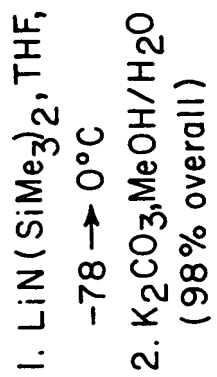
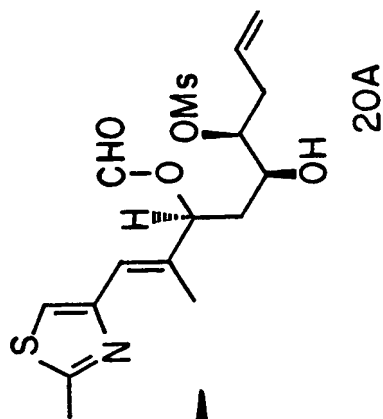
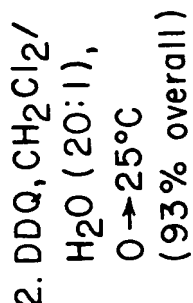
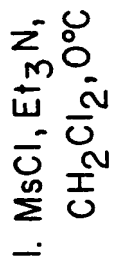
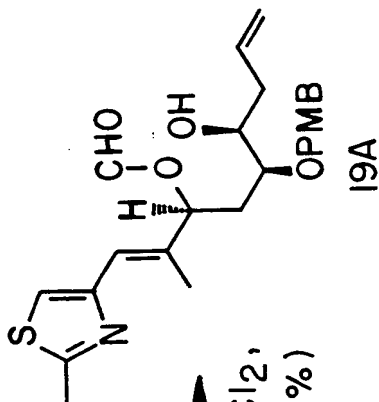
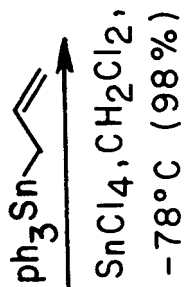
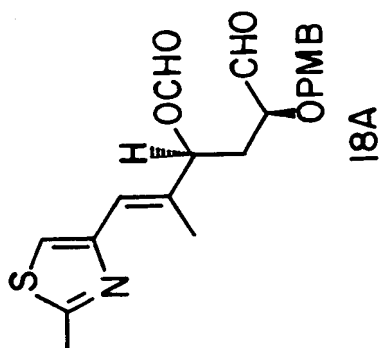
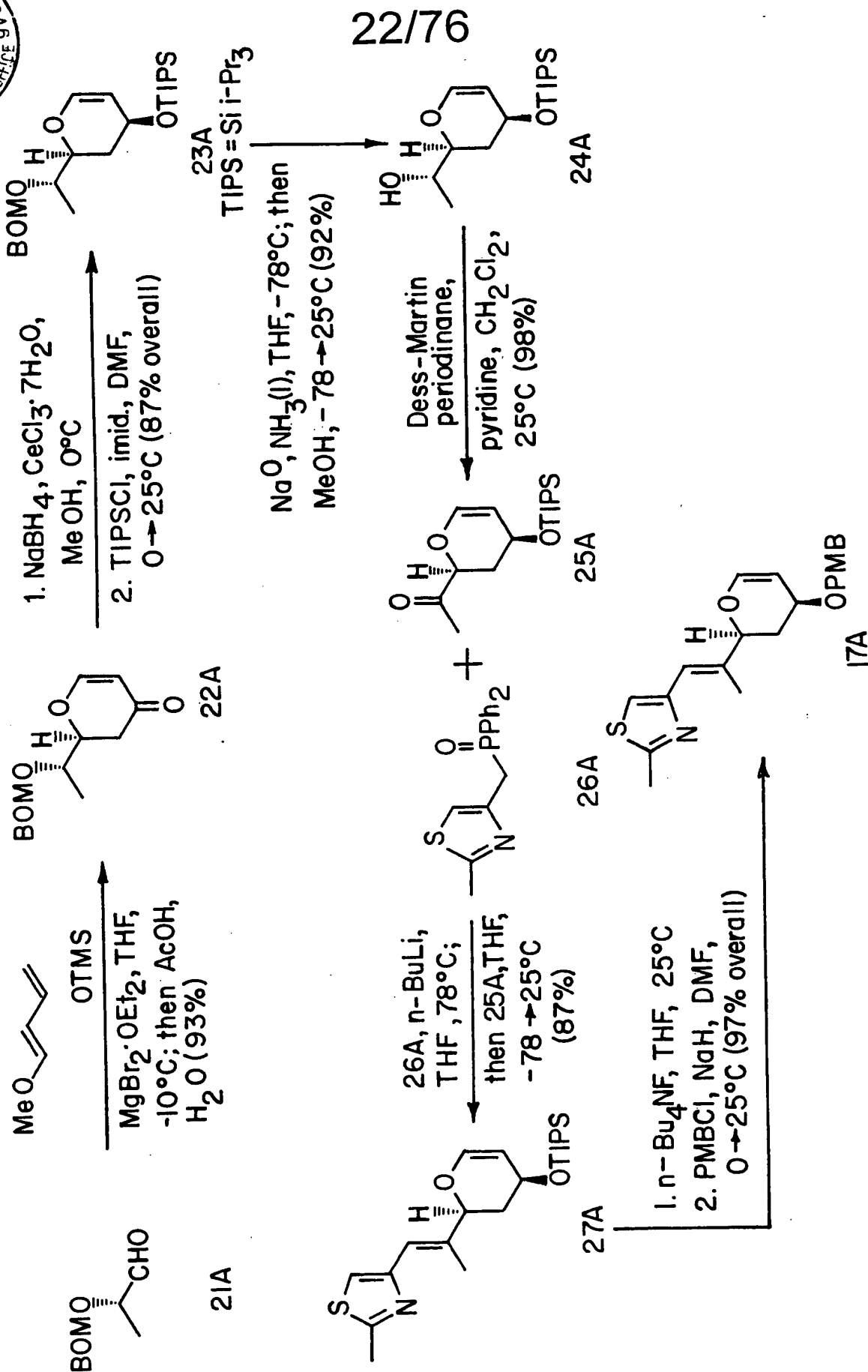


FIG. 15



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FIG. 16

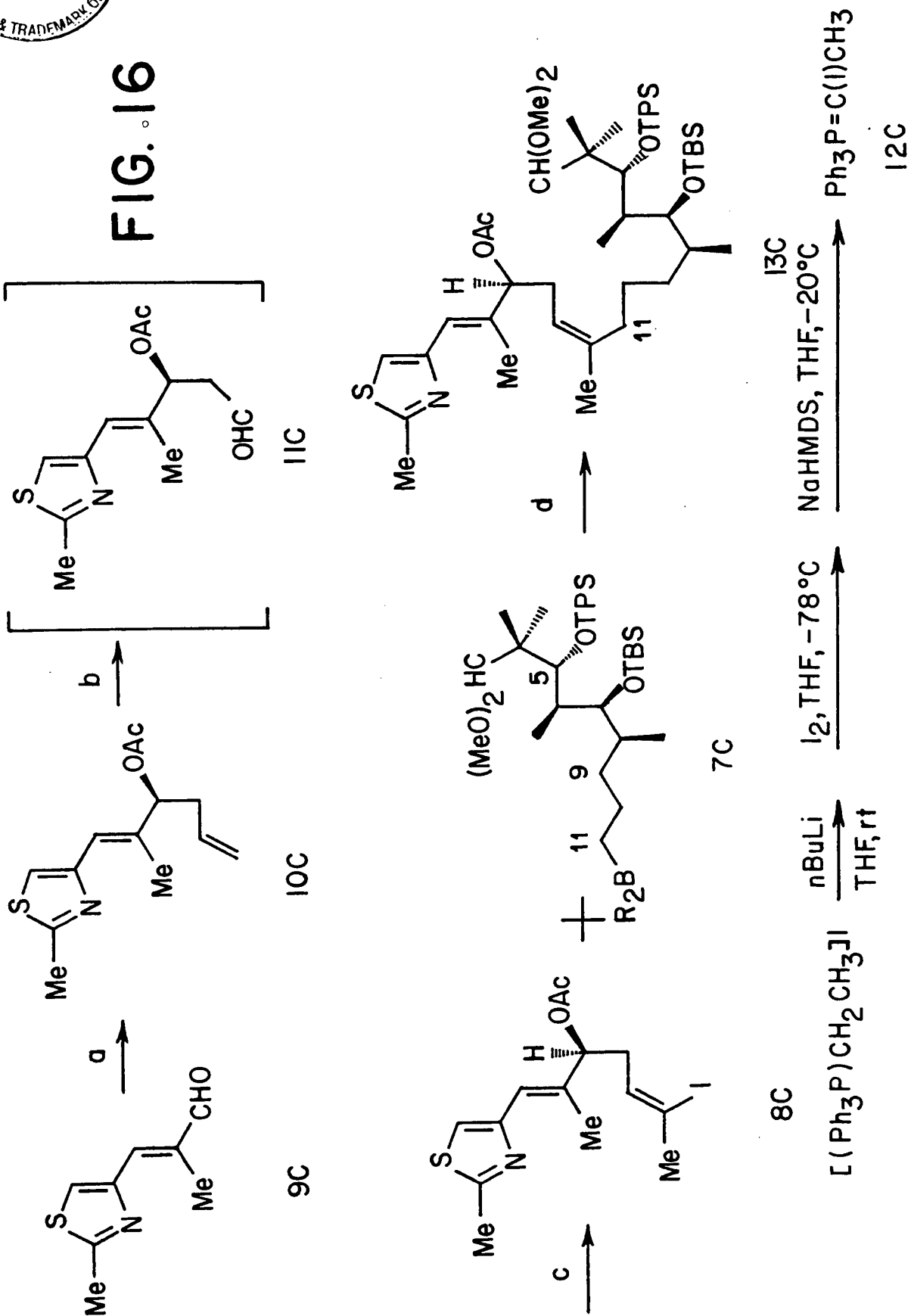
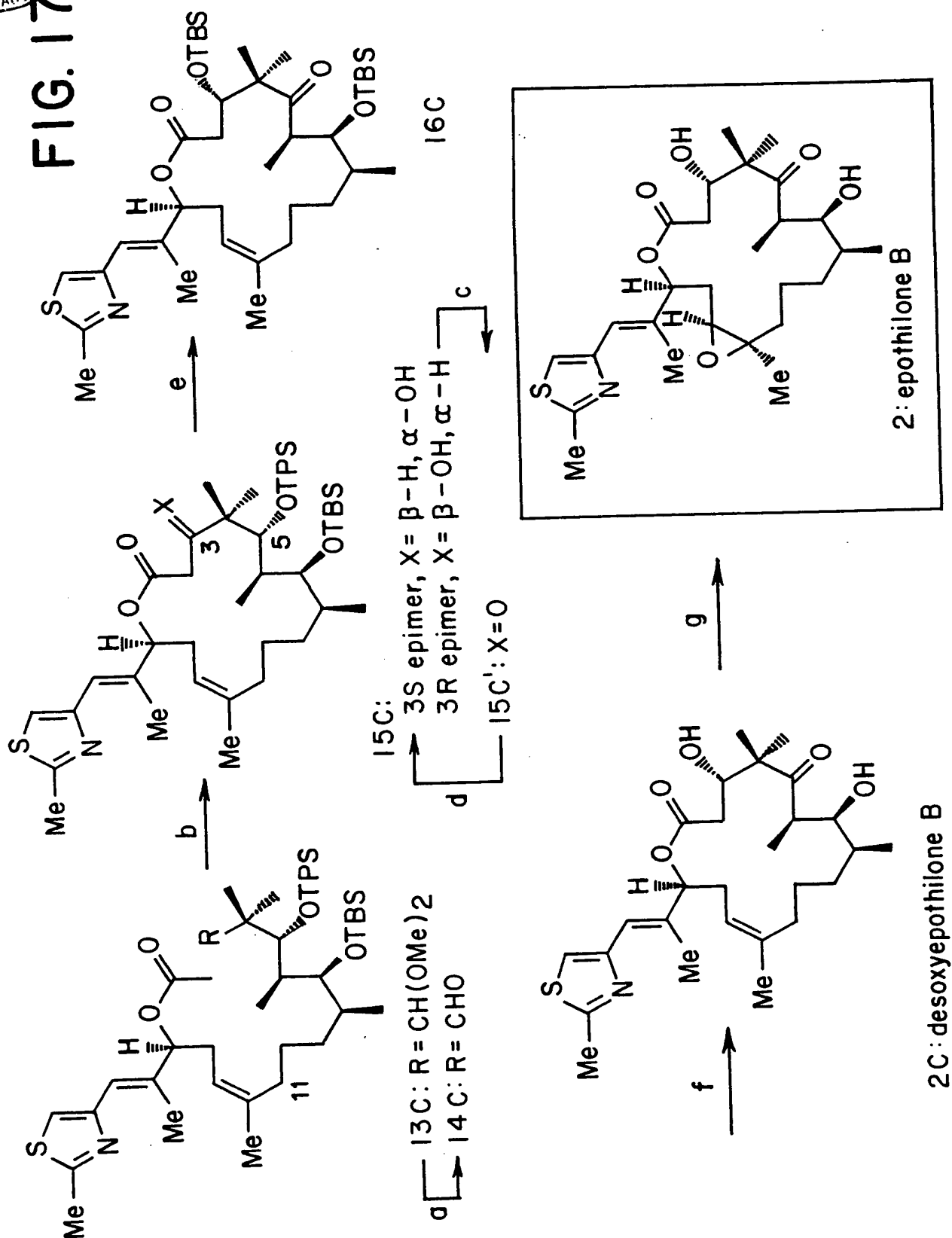


FIG. 1



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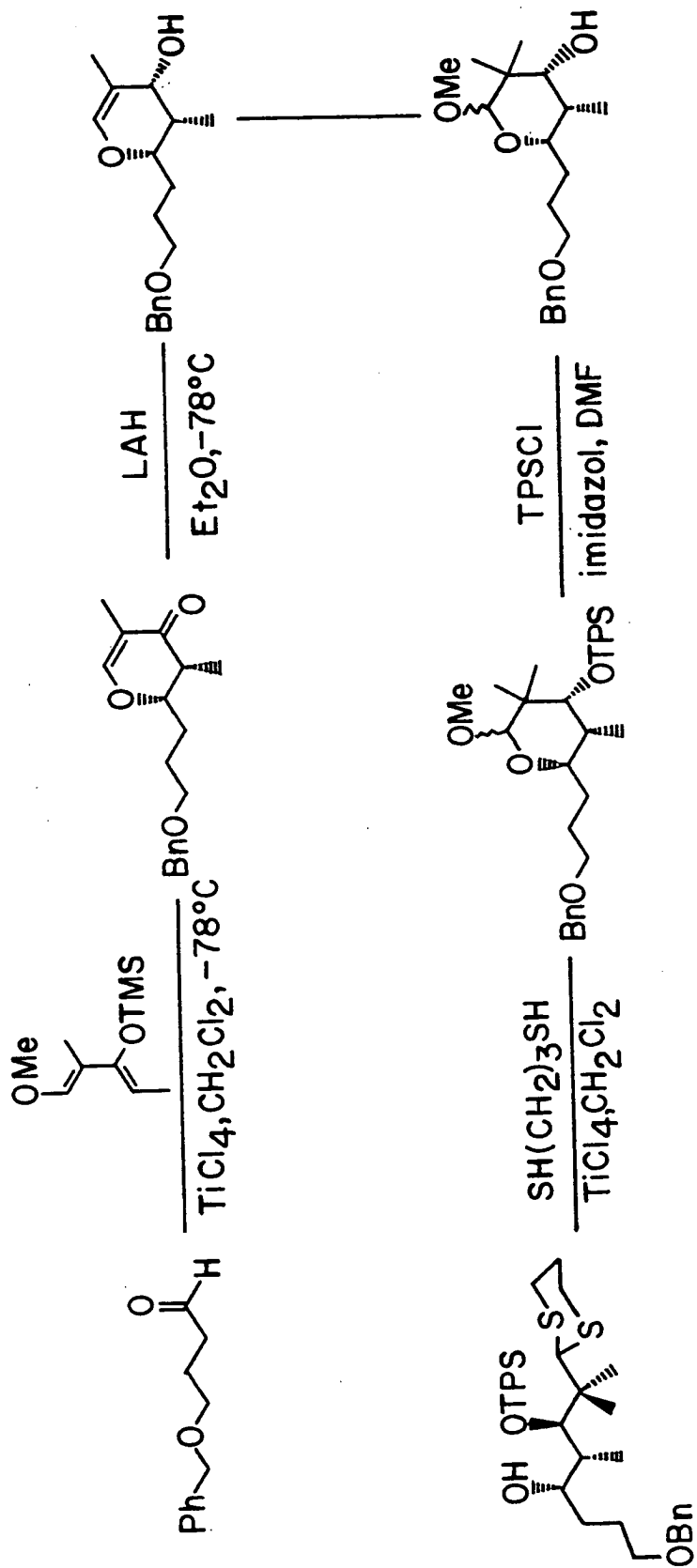
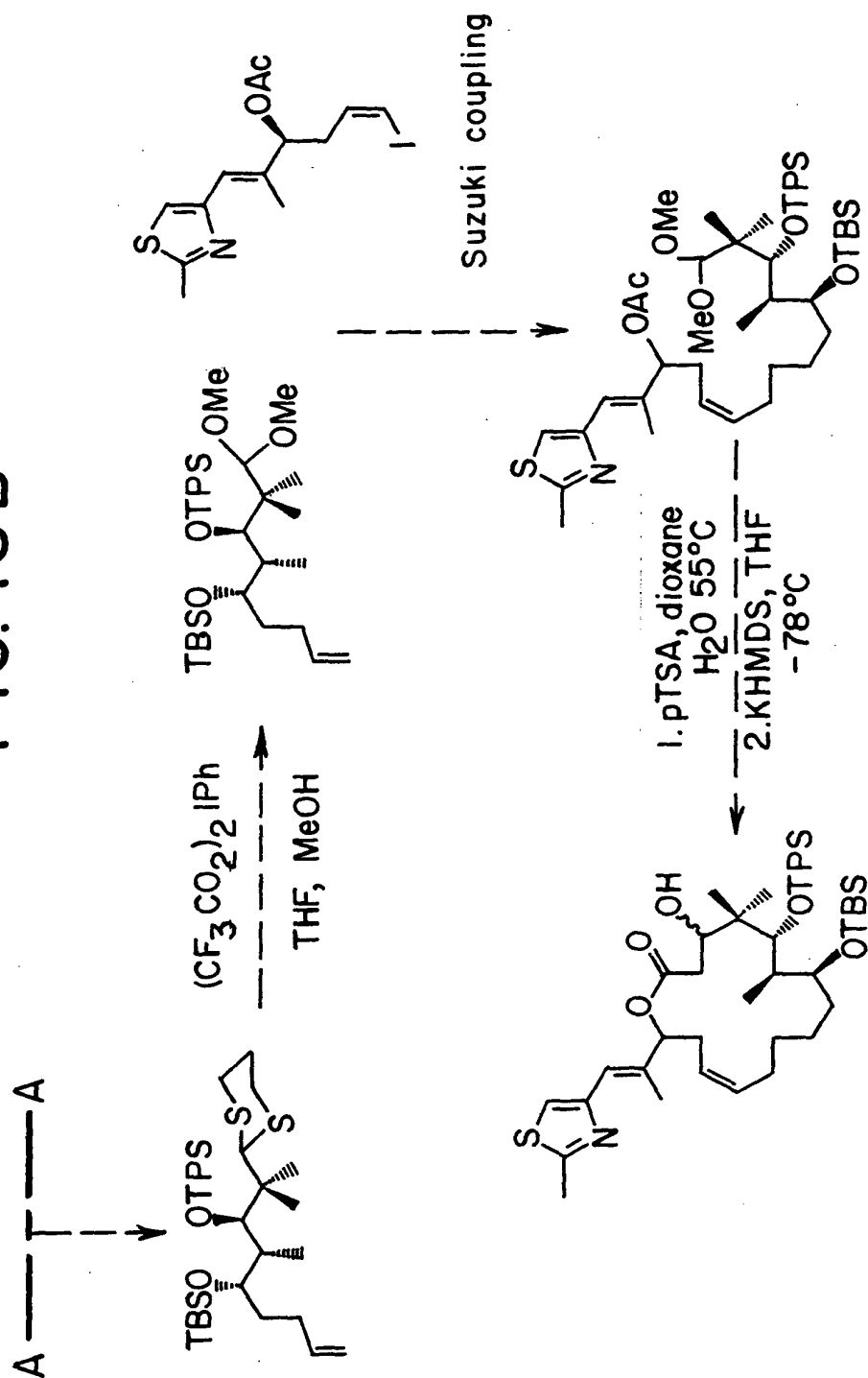


FIG. 18A

A ——— A

FIG. 18B



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FIG. 19A

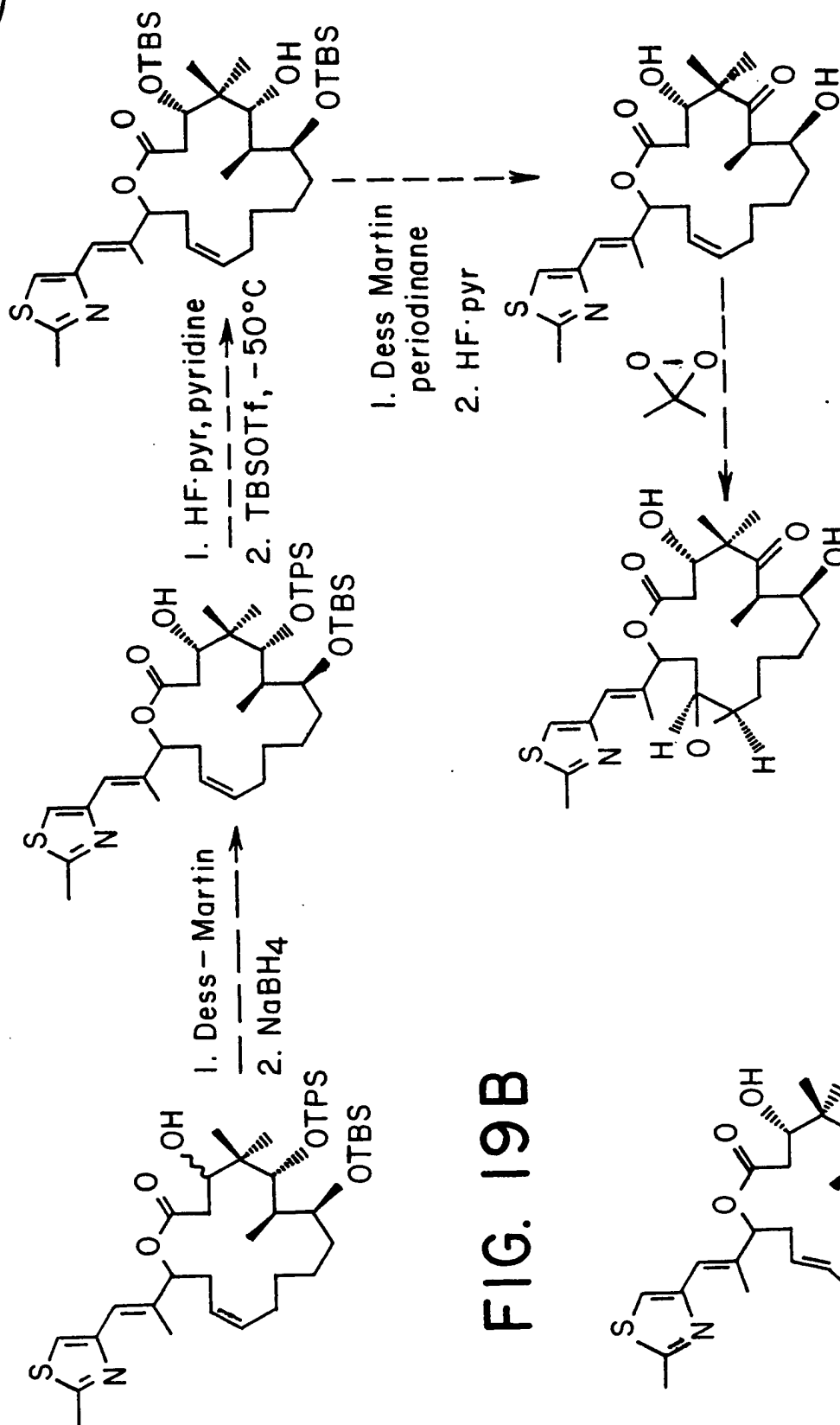


FIG. 19B

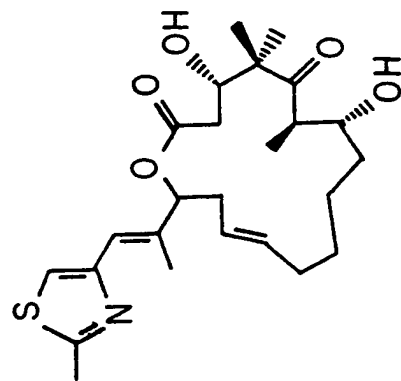


FIG. 19C

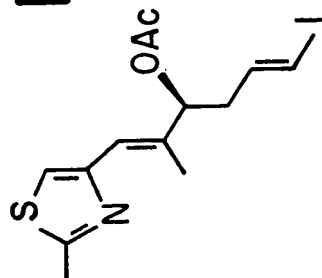
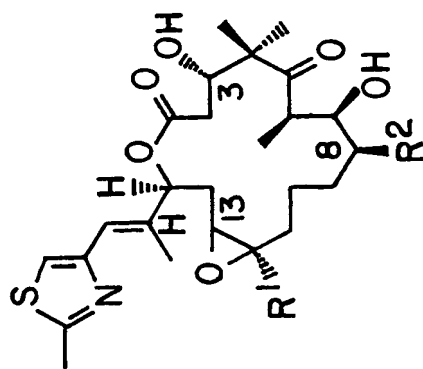


FIG. 20A



R¹ = H, R² = Me; epothilone A

R¹ = R² = Me; epothilone B

R¹ = R² = H; C₈-desmethyl-epothilone A (3D)

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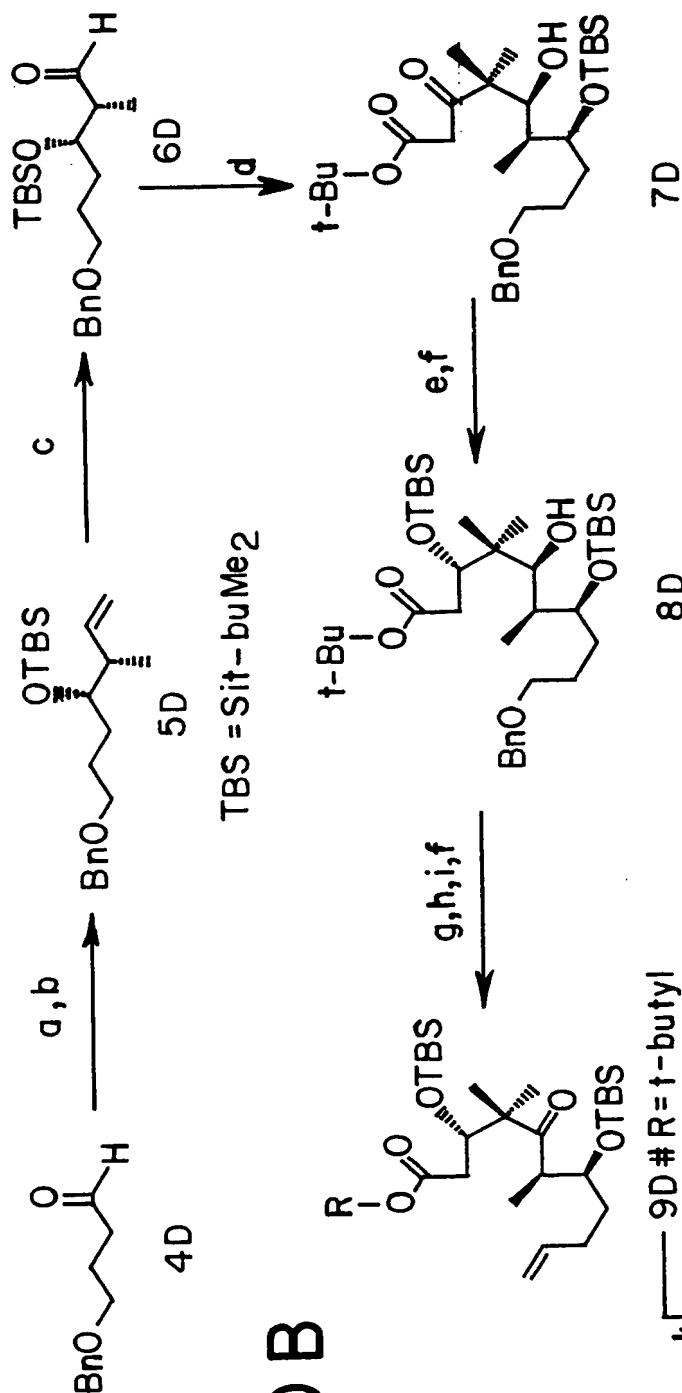


FIG. 20B

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FIG. 21

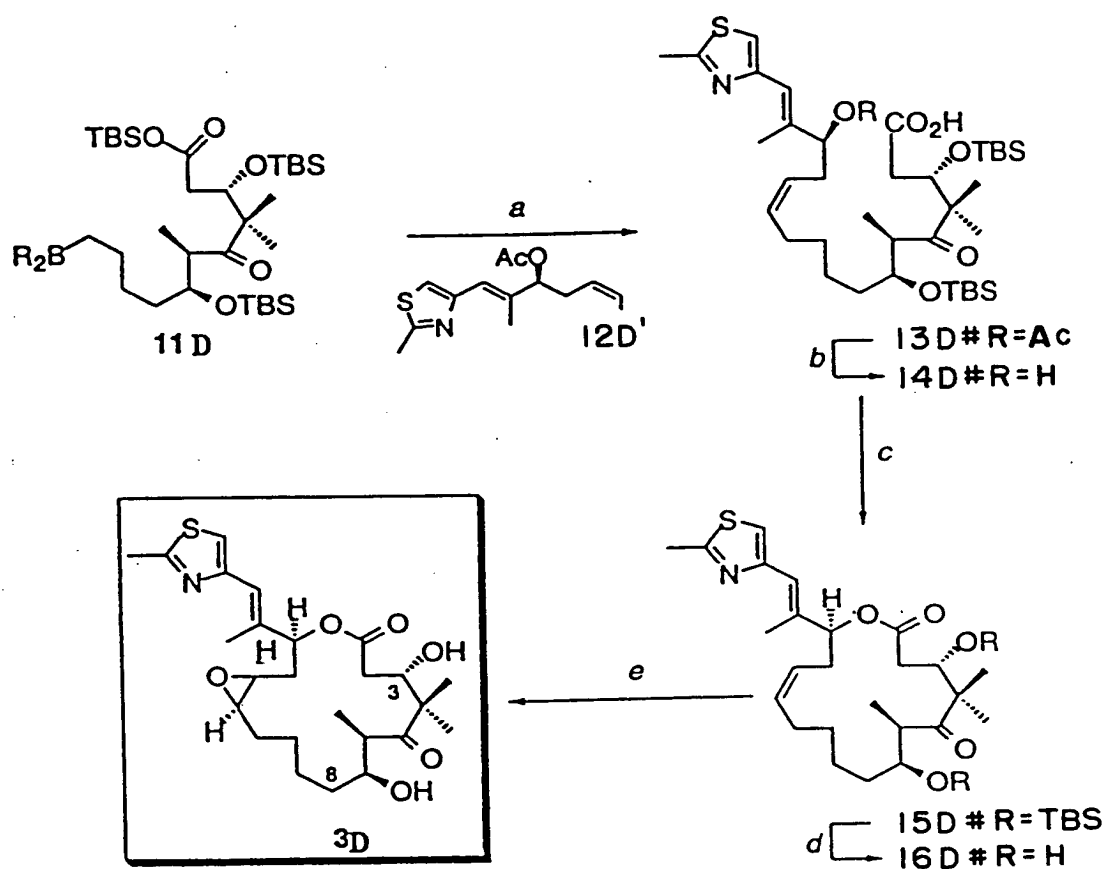


FIG. 22A

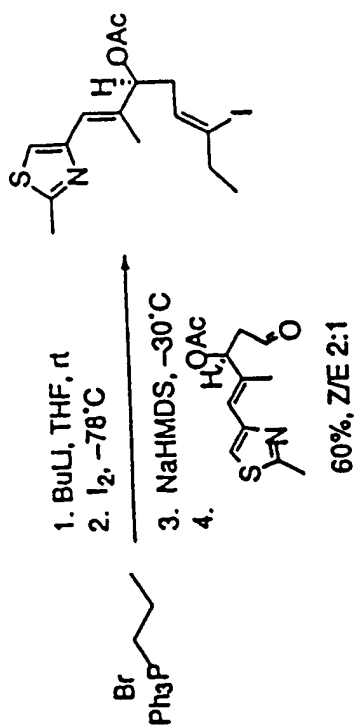
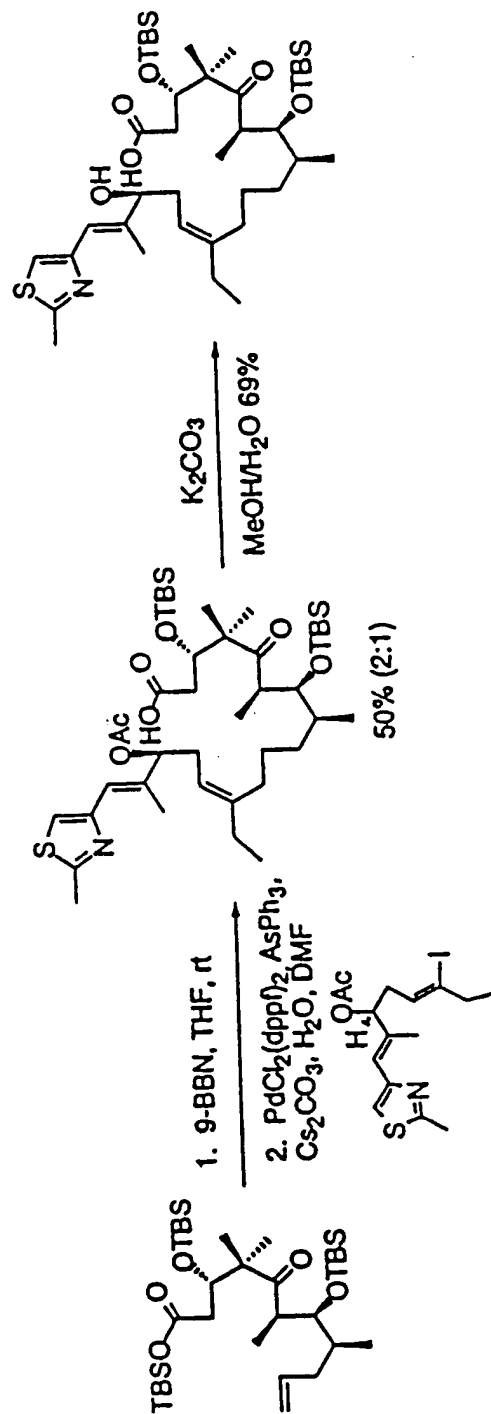


FIG. 22B



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FIG. 22C

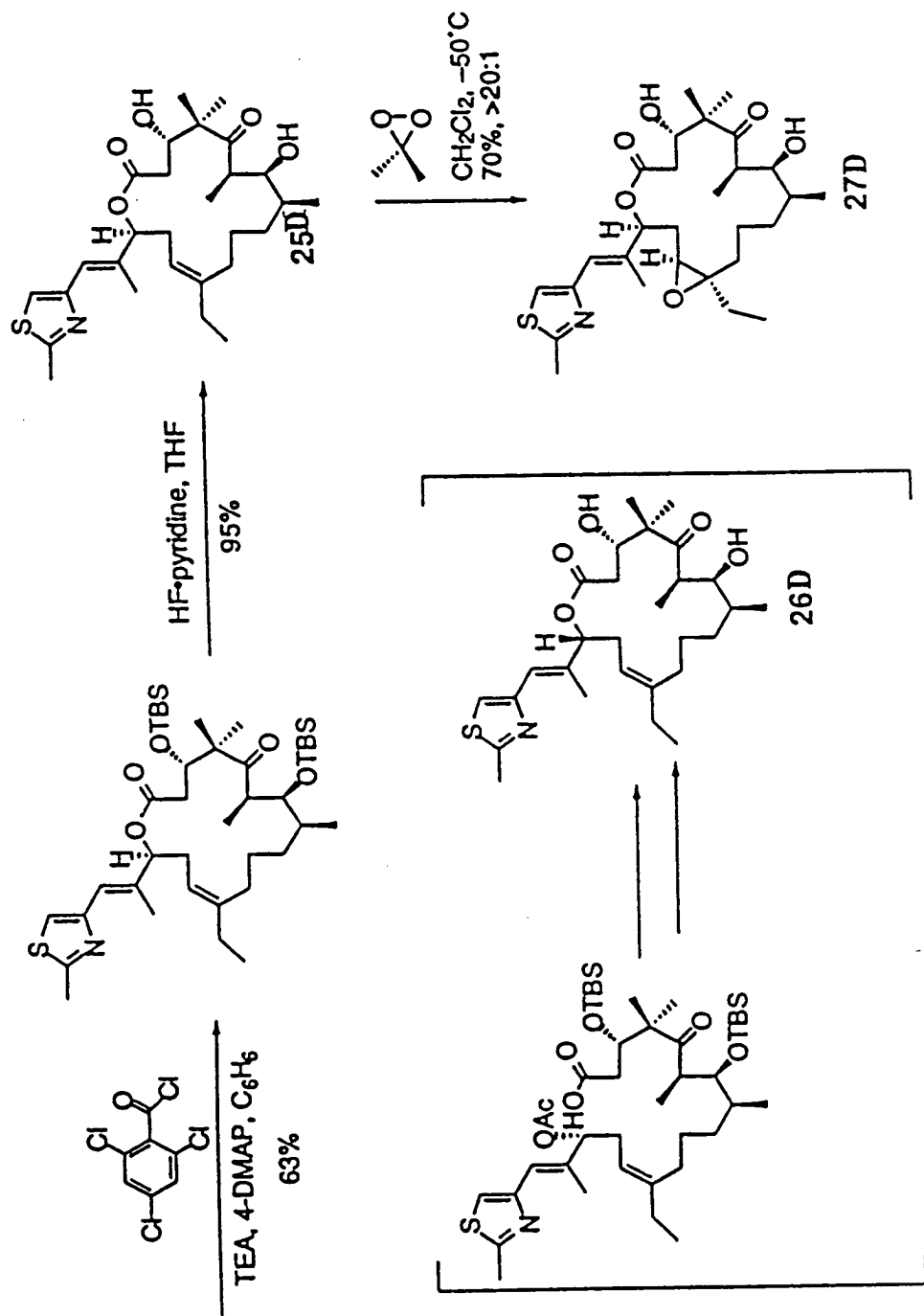


FIG. 23A

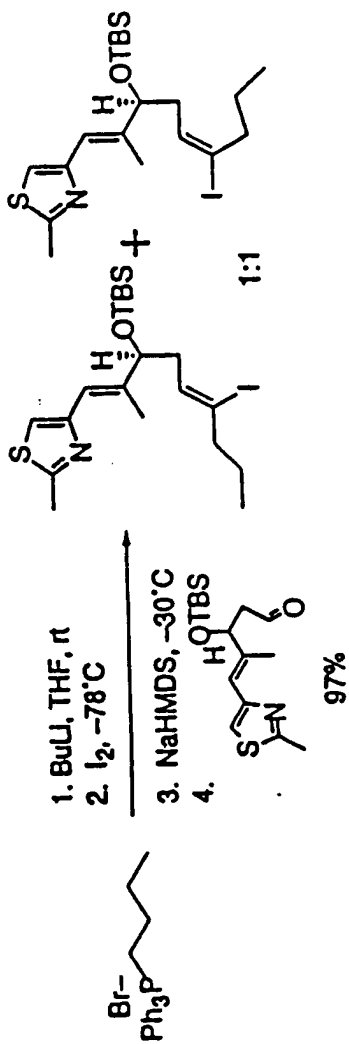


FIG. 23B

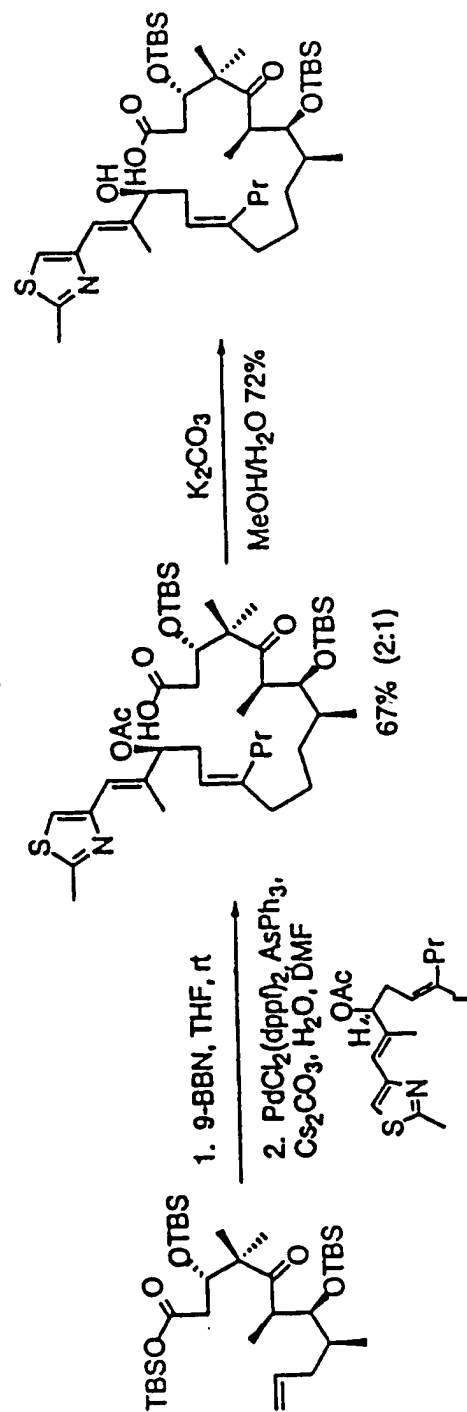


FIG. 23C

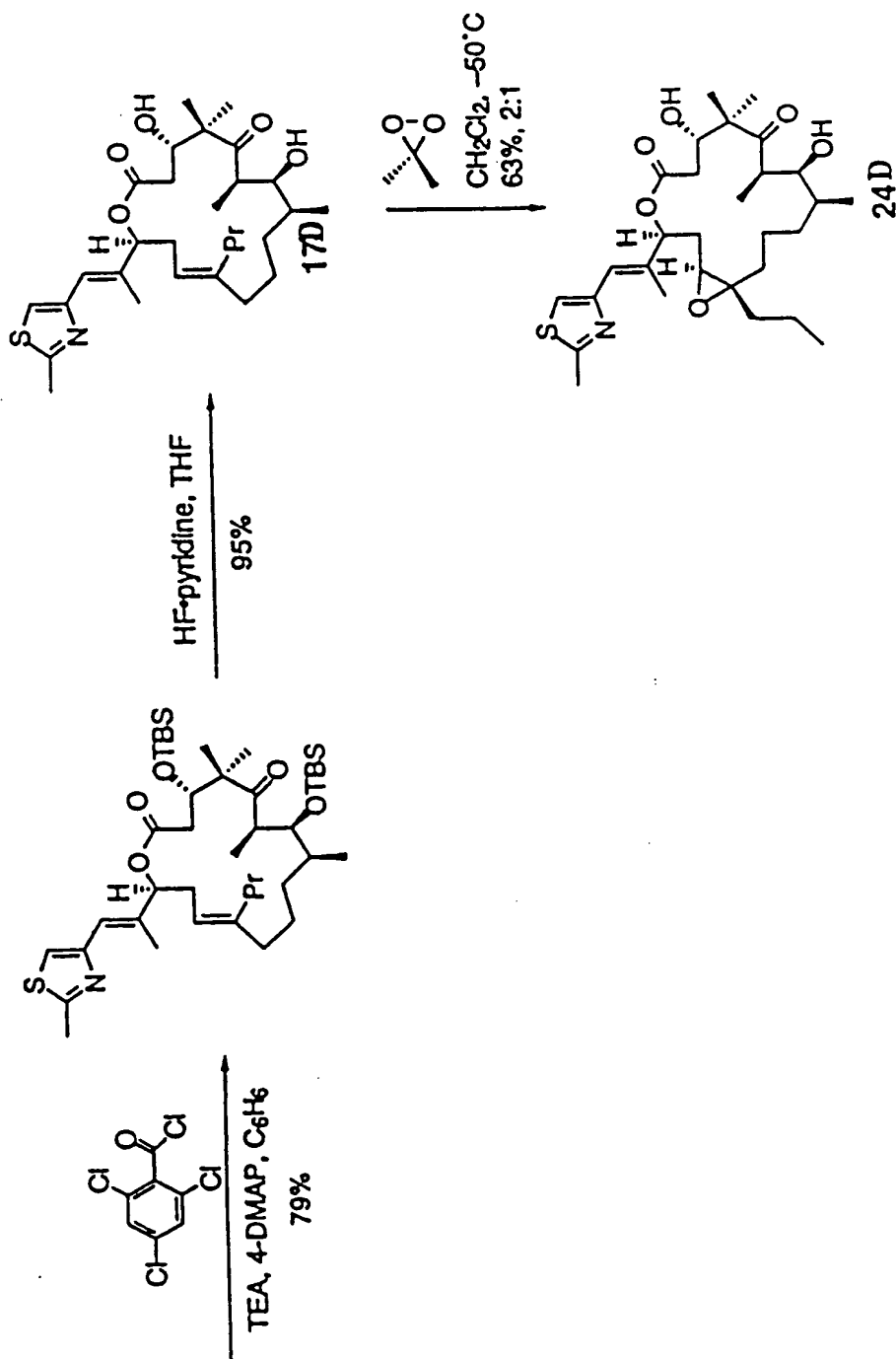
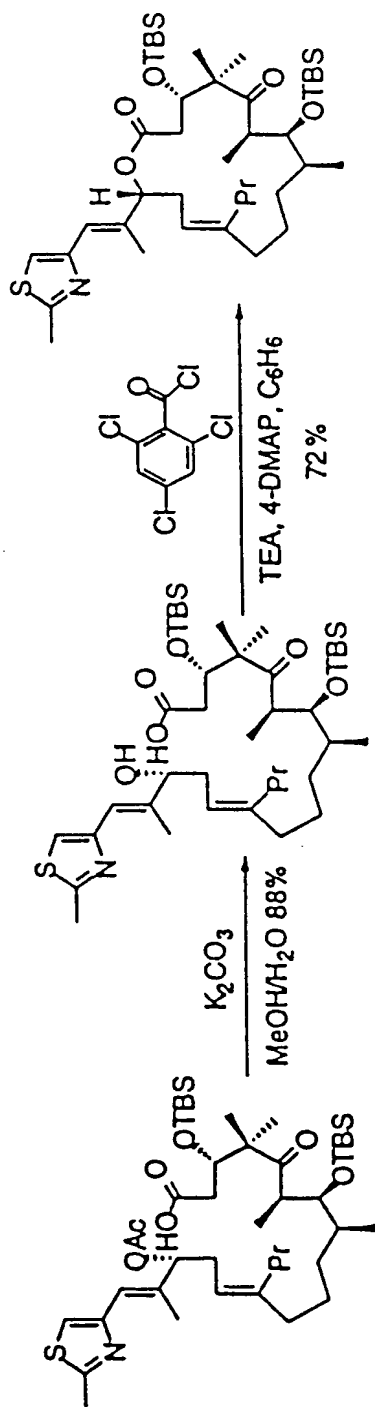


FIG. 24A



minor product from suzuki
coupling reaction

FIG. 24B

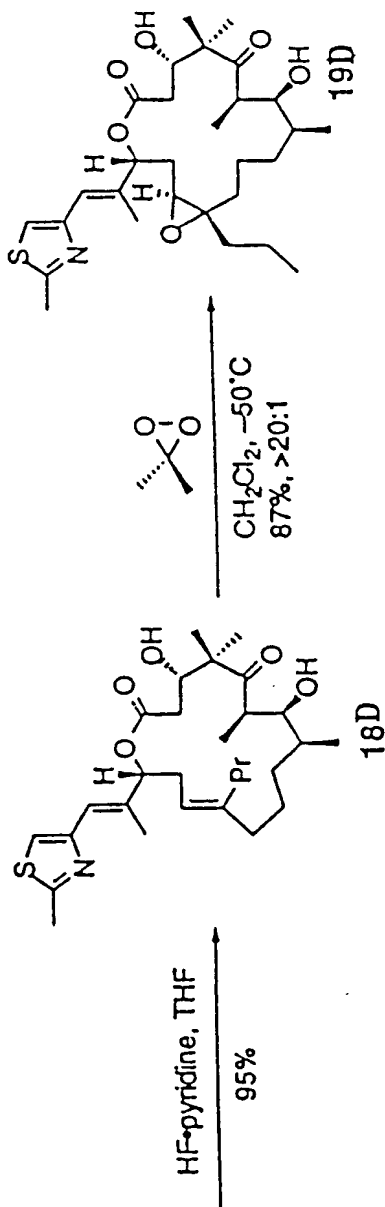


FIG. 25A

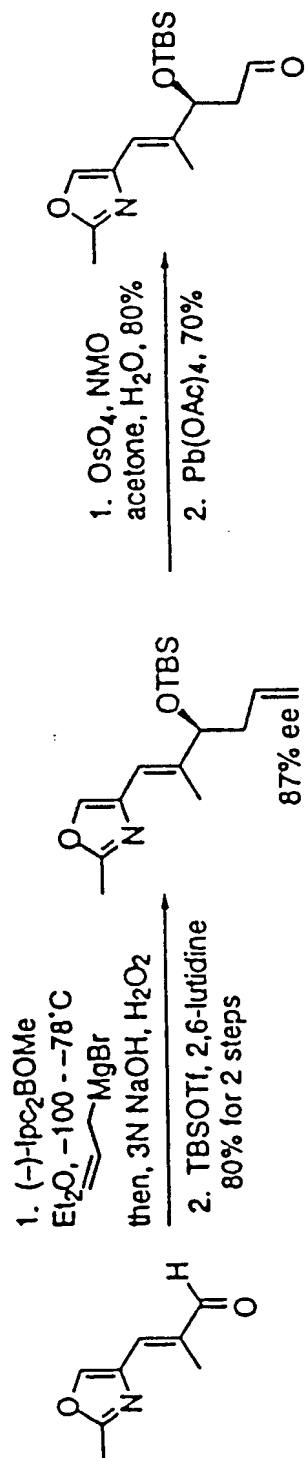


FIG. 25B

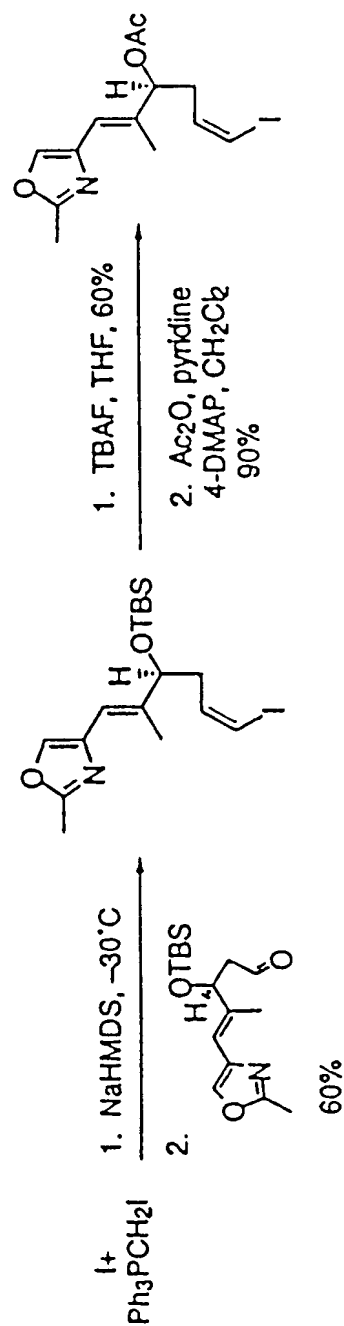


FIG. 25D

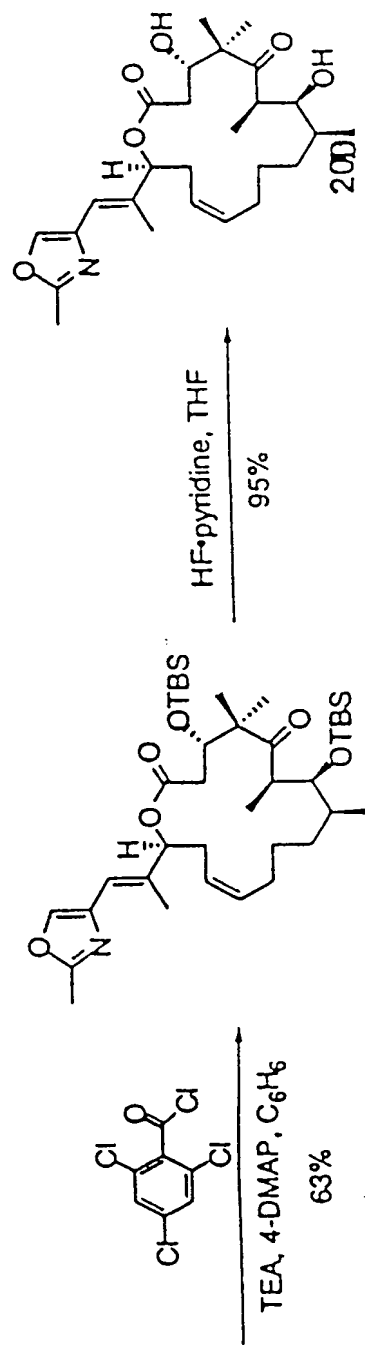


FIG. 26A

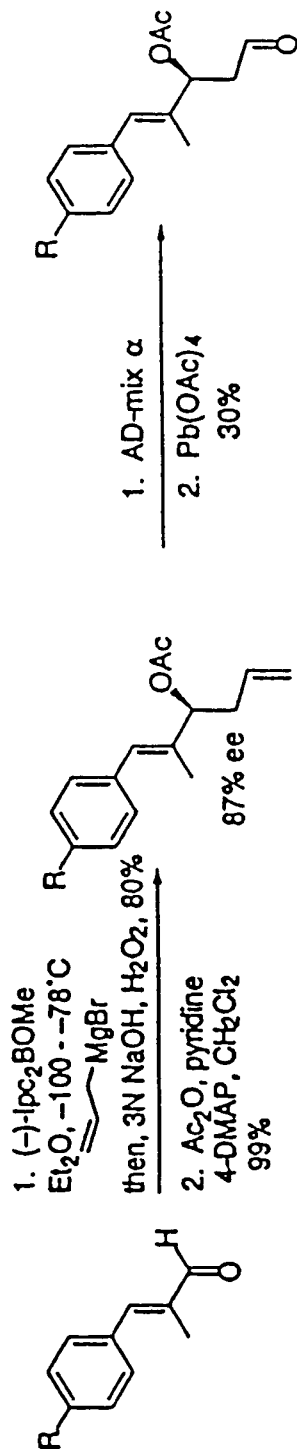
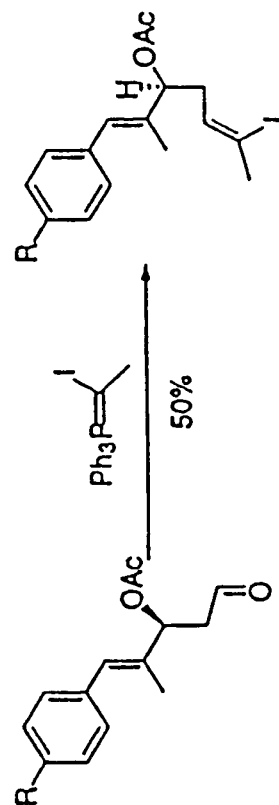


FIG. 26B



R = H, F, CF₃
R=H is the only compound
completed, F and CF₃ are nearly
completed

FIG. 26C

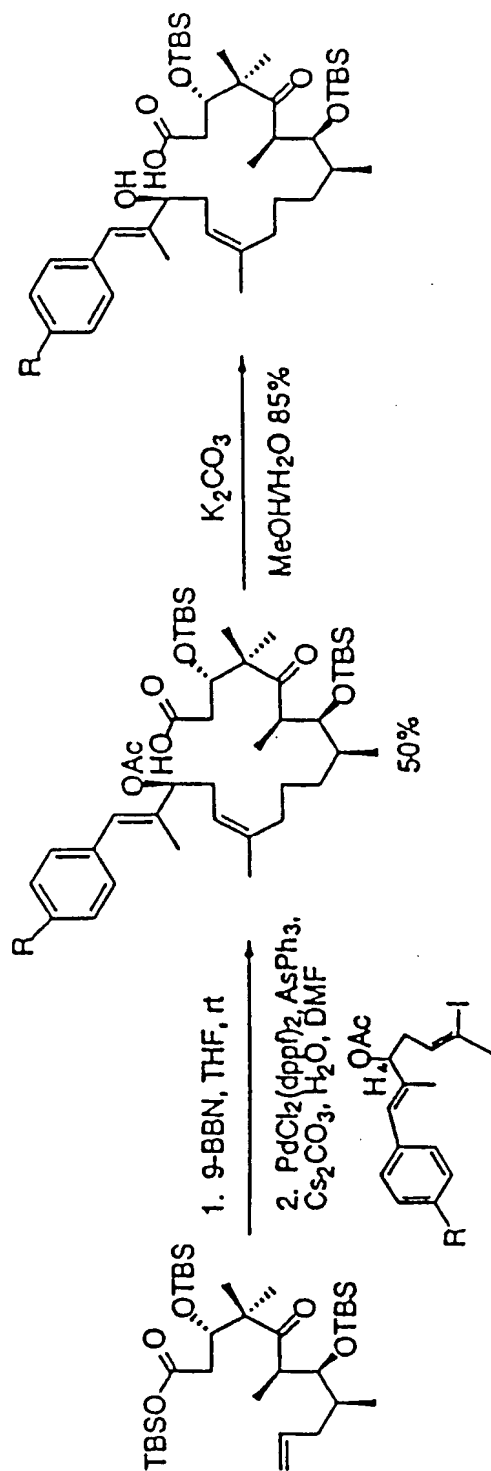


FIG. 26D

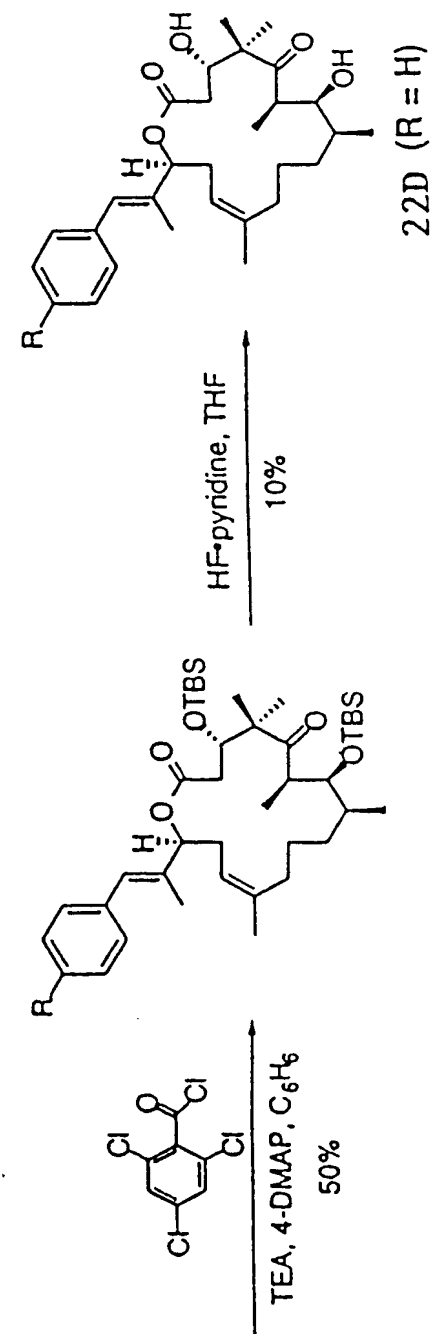


FIG. 27A

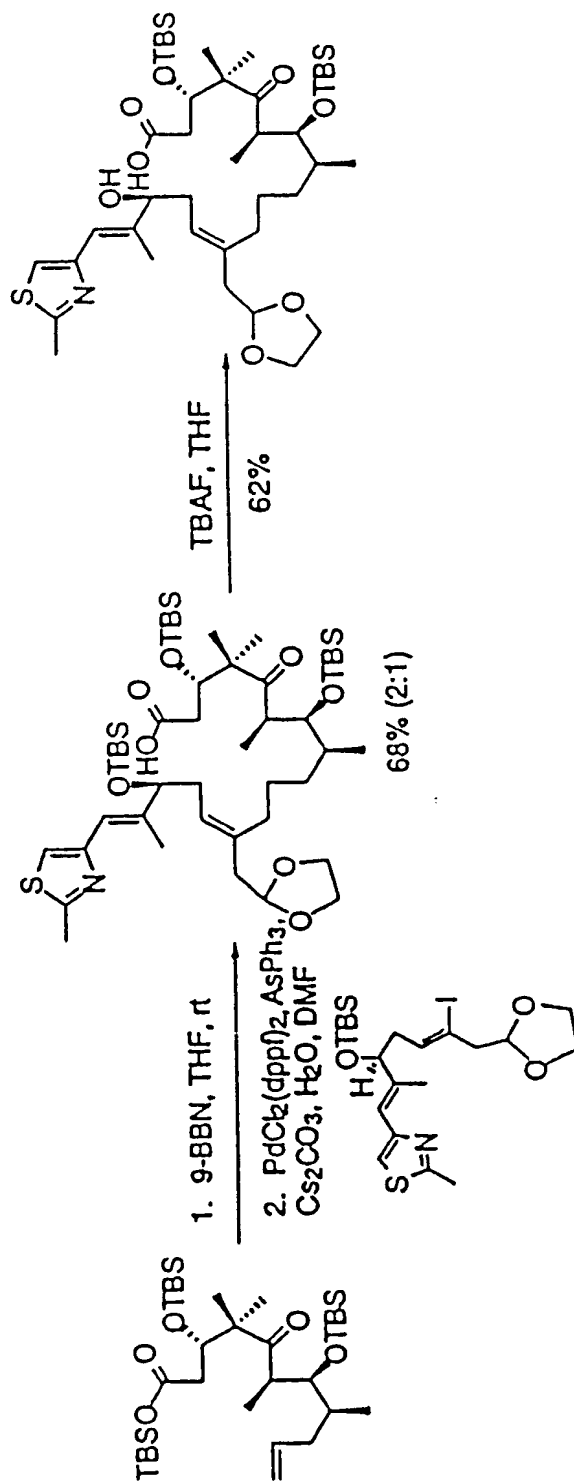
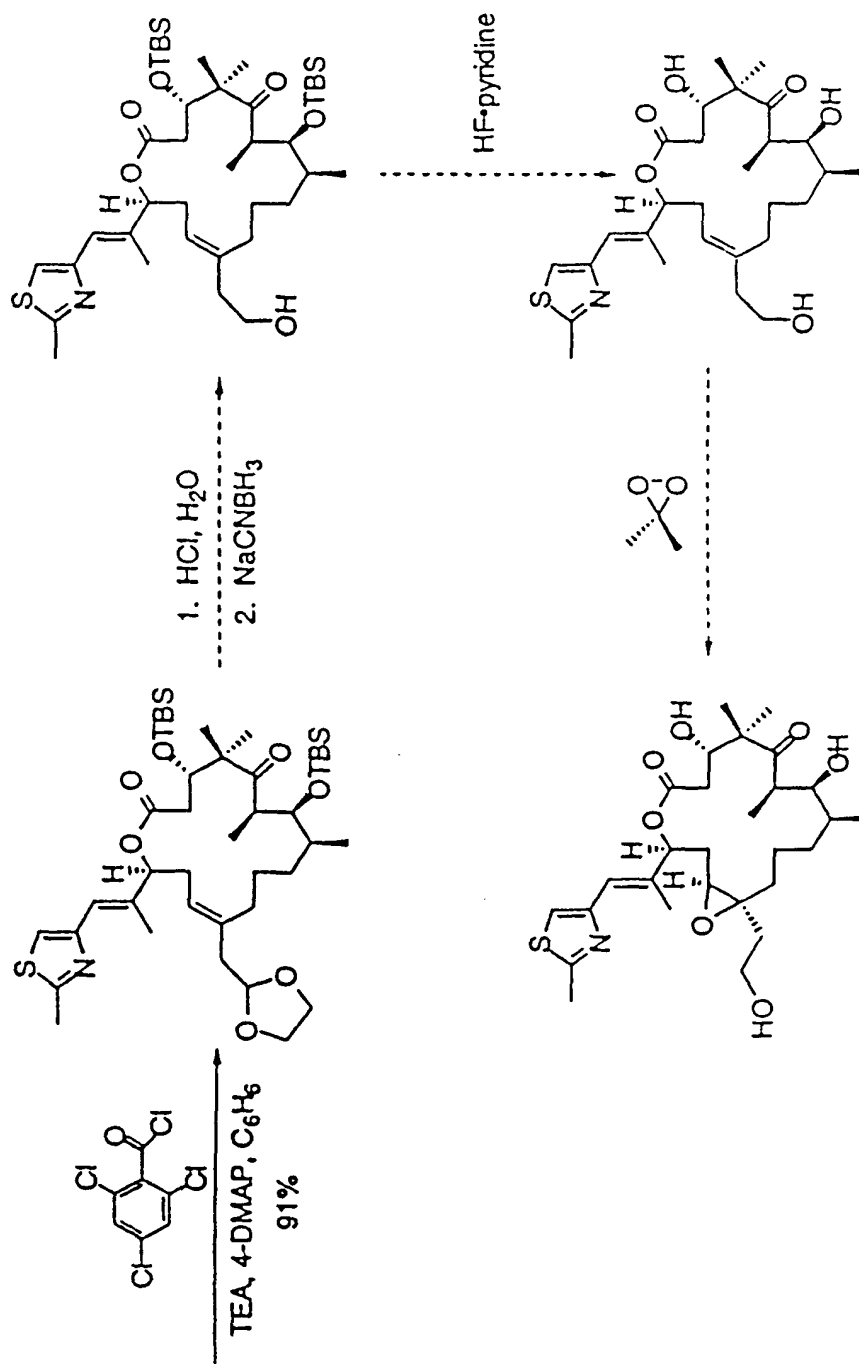


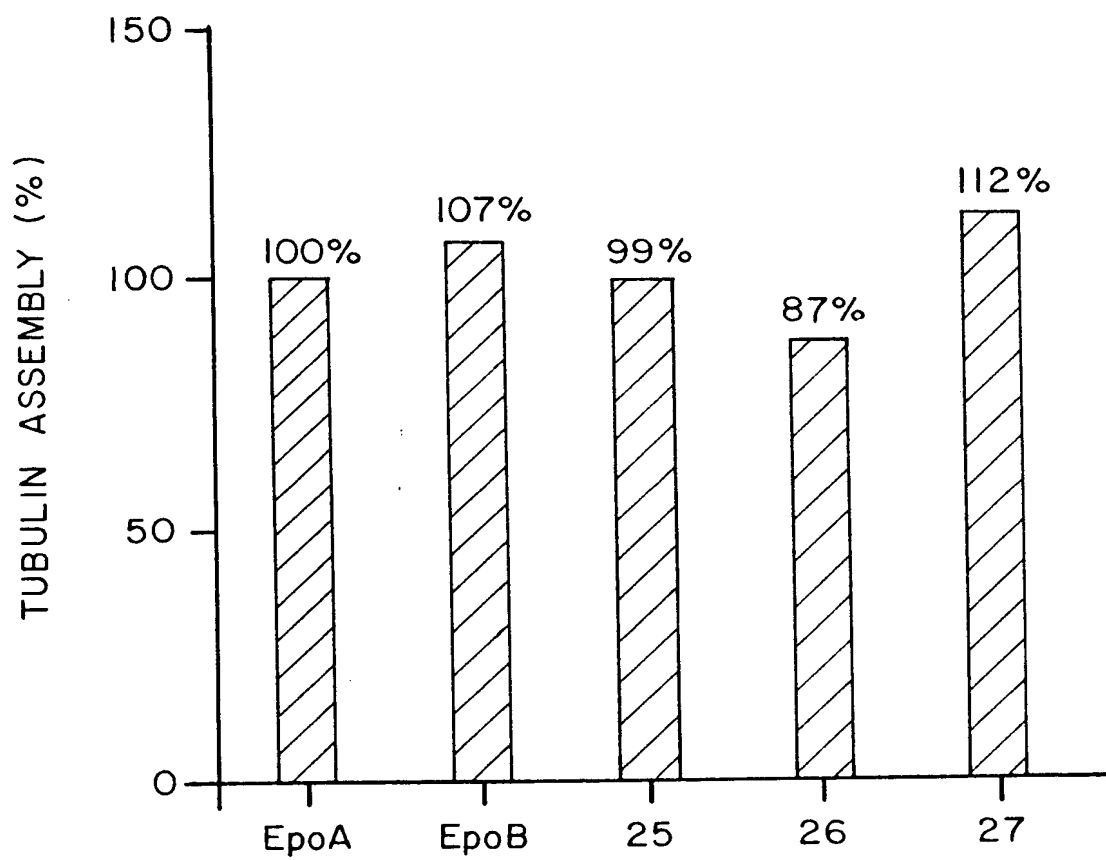
FIG. 27C

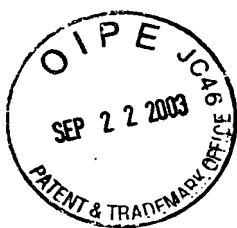




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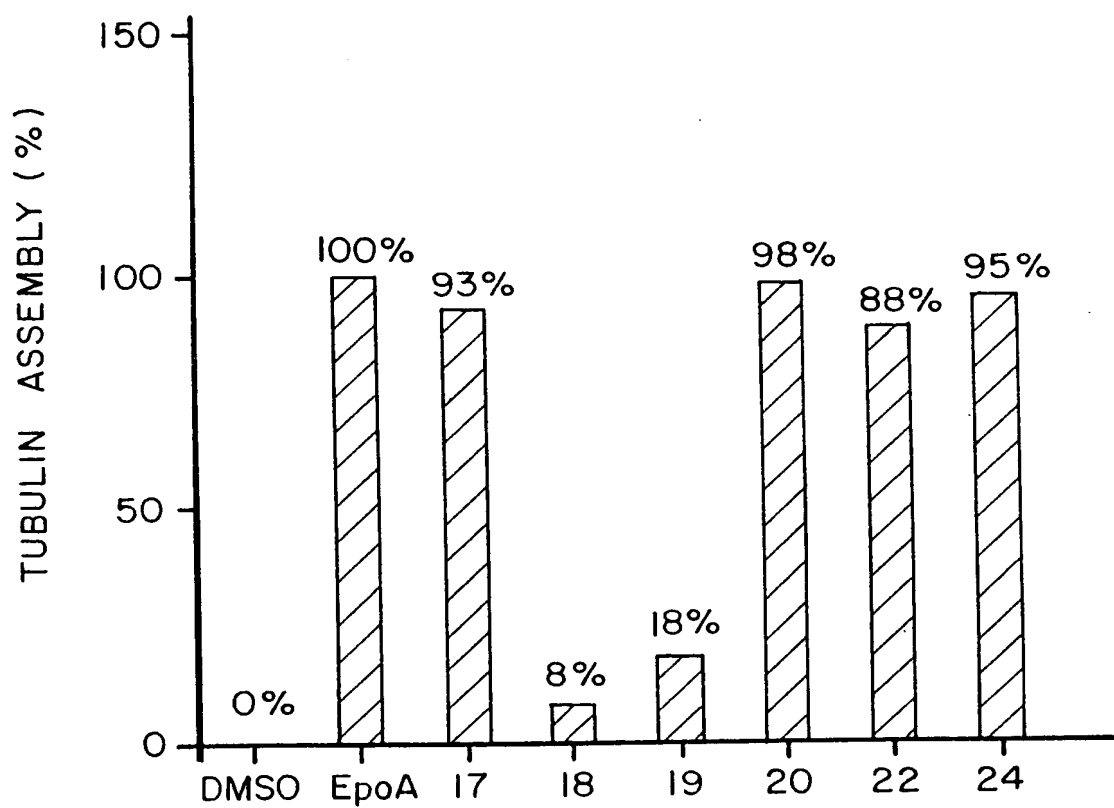
FIG. 28A





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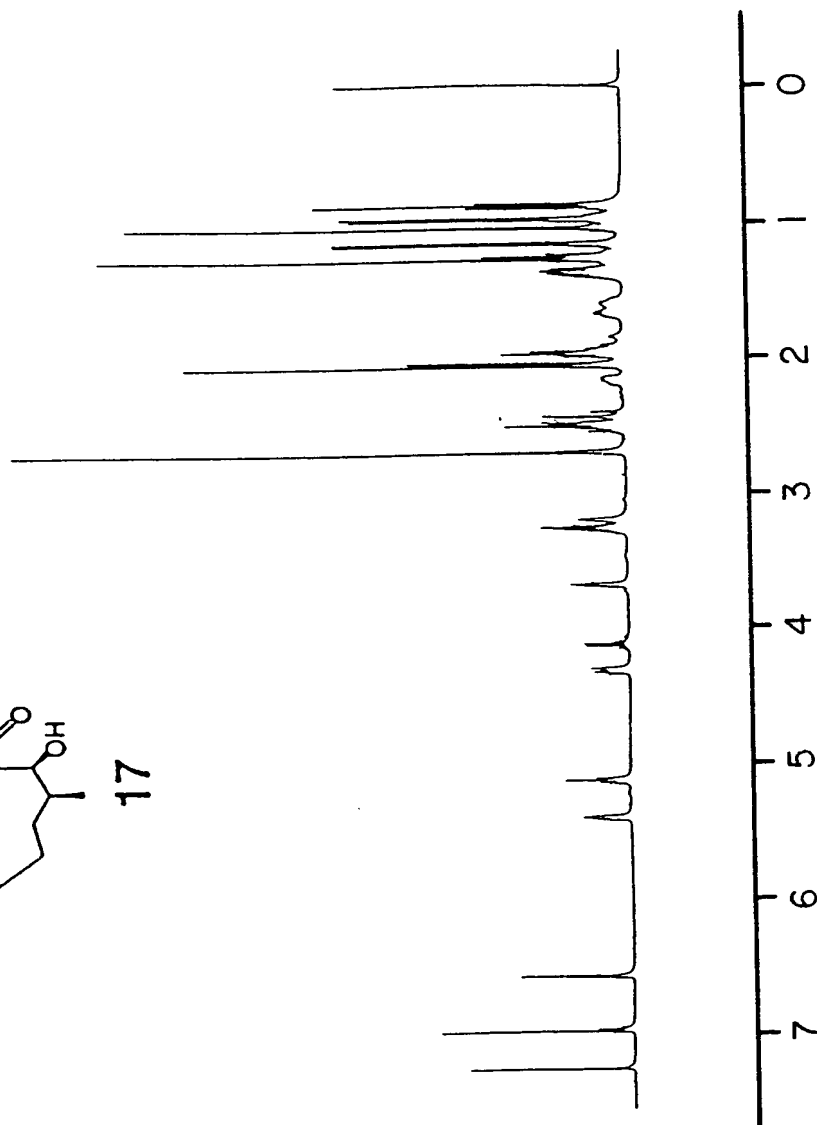
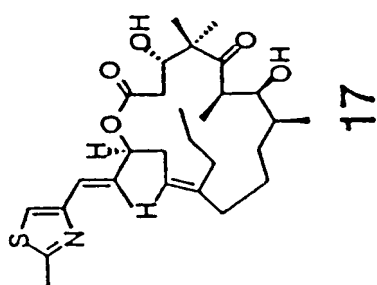
FIG. 28B





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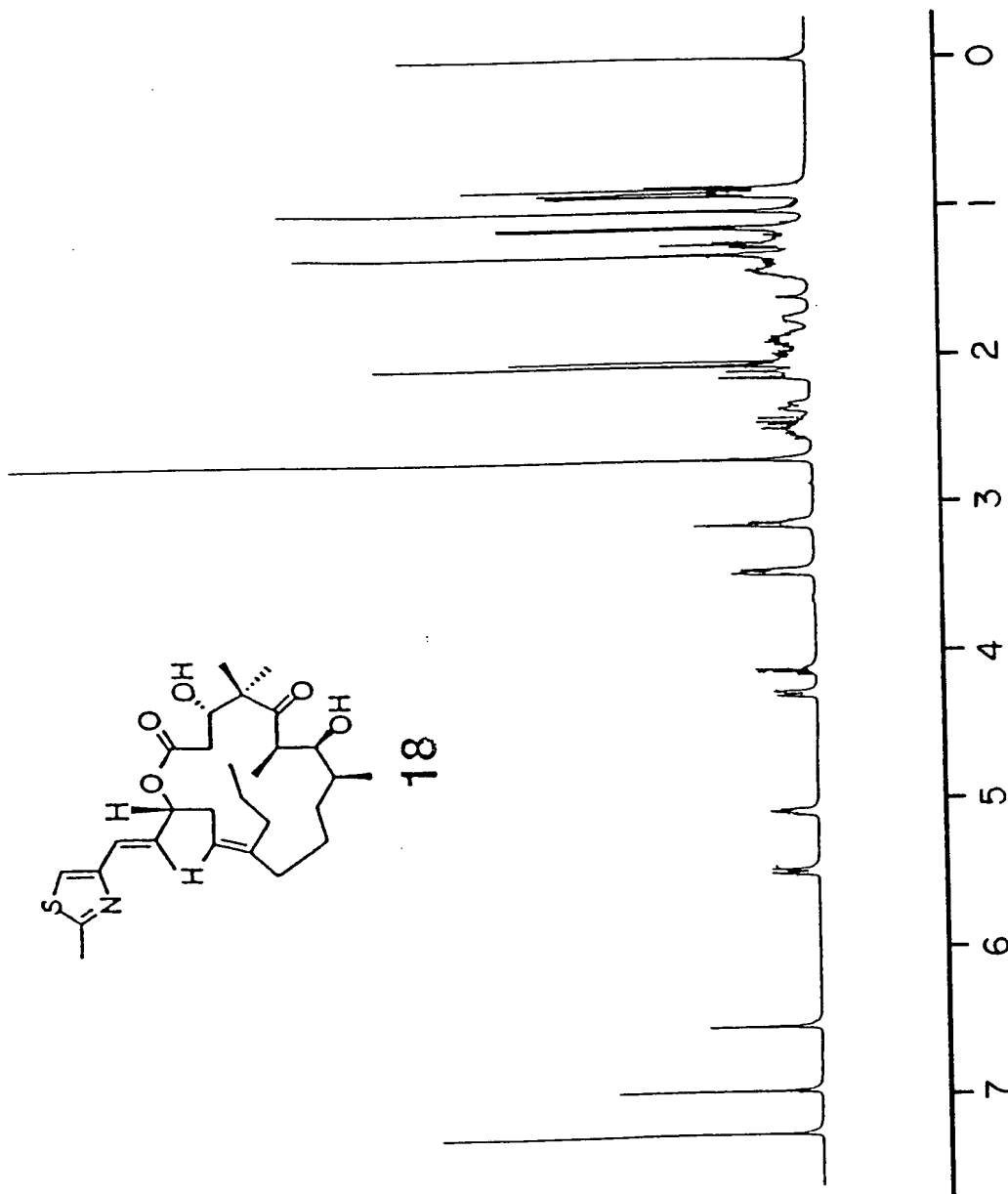
FIG. 29





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FIG. 30



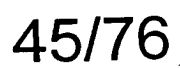
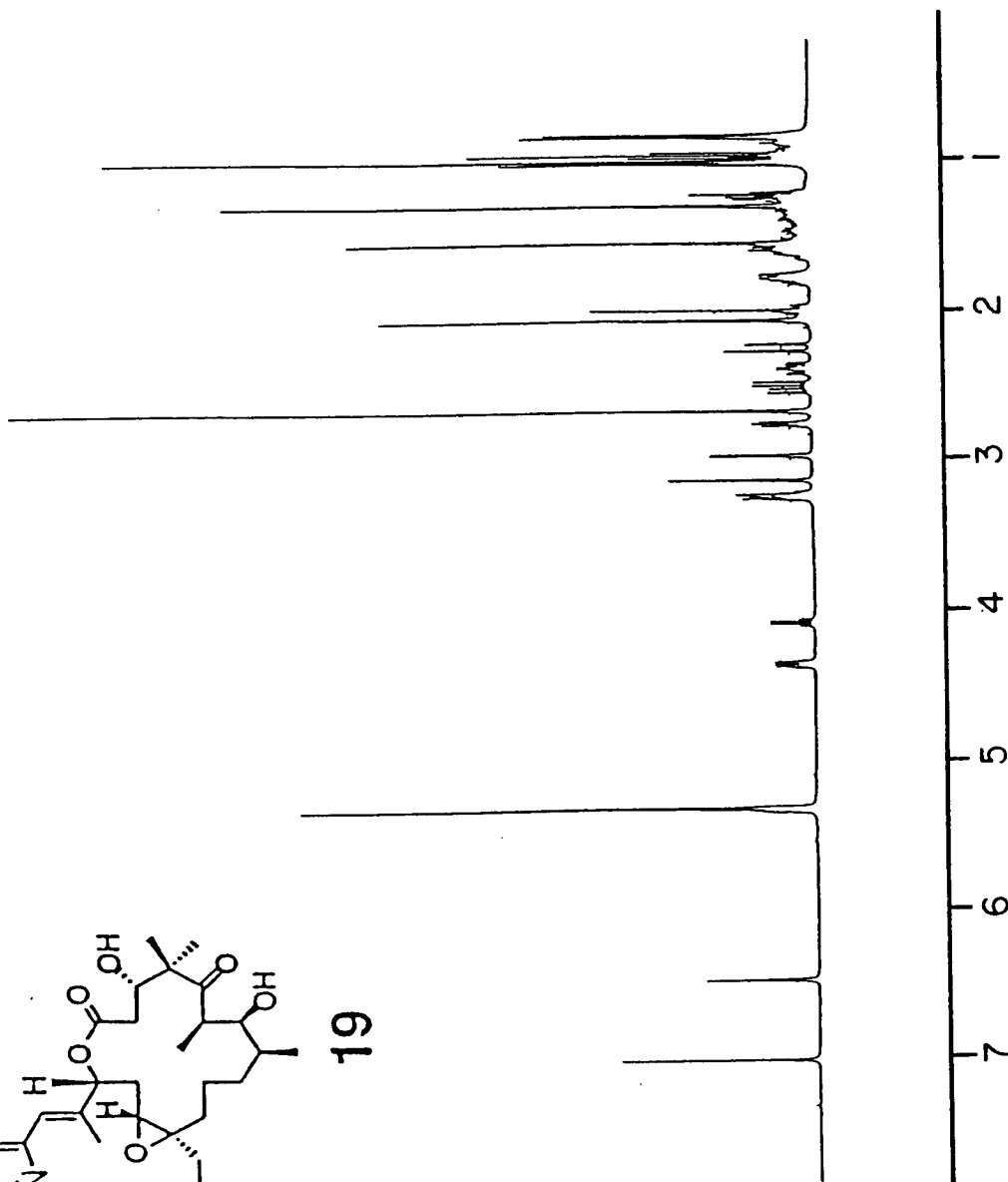
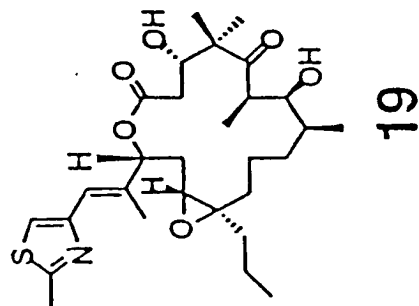


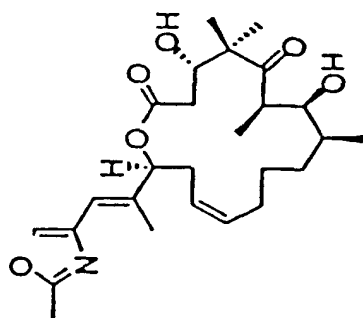
FIG. 3



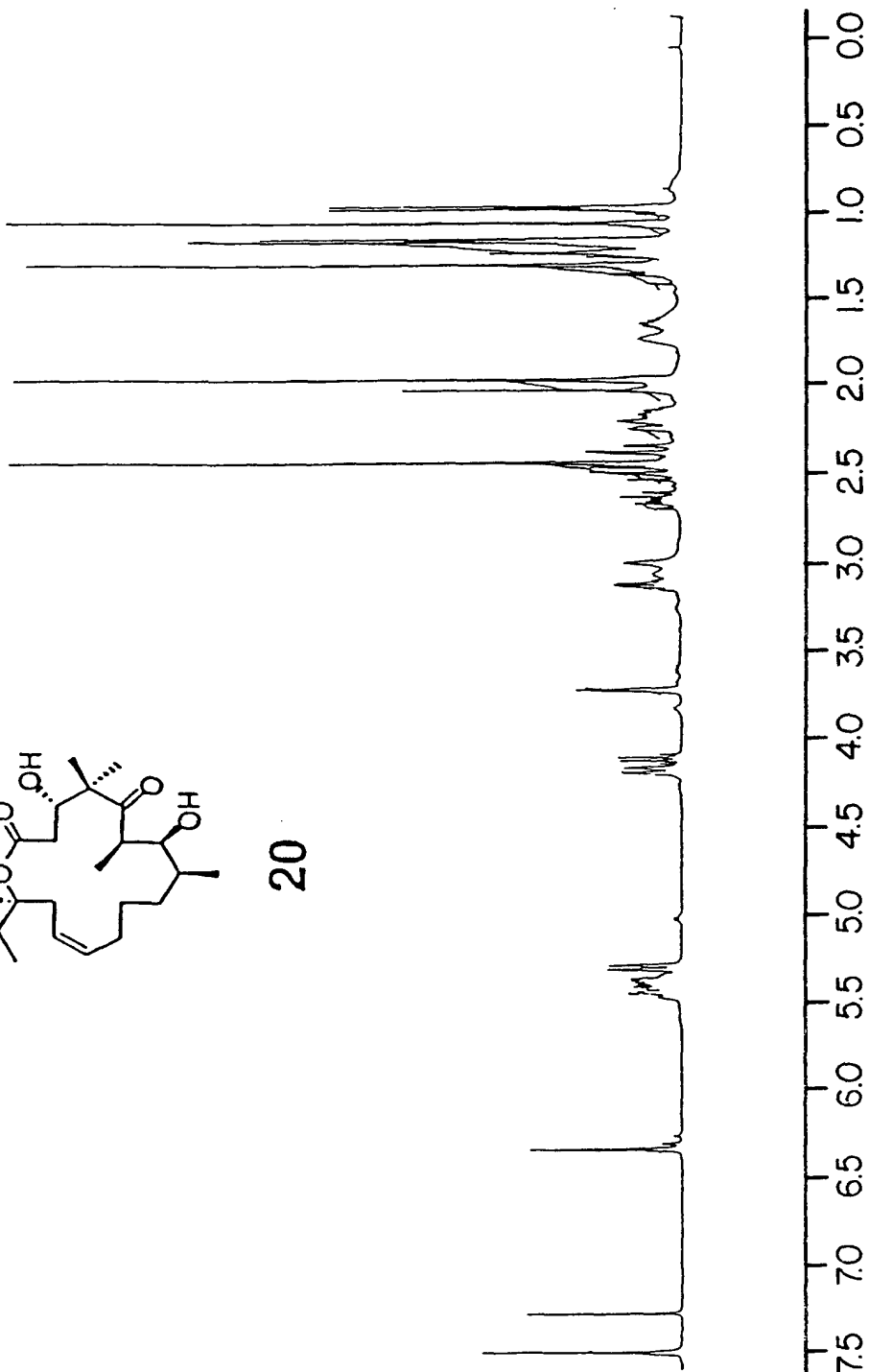


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FIG. 32



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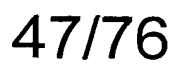
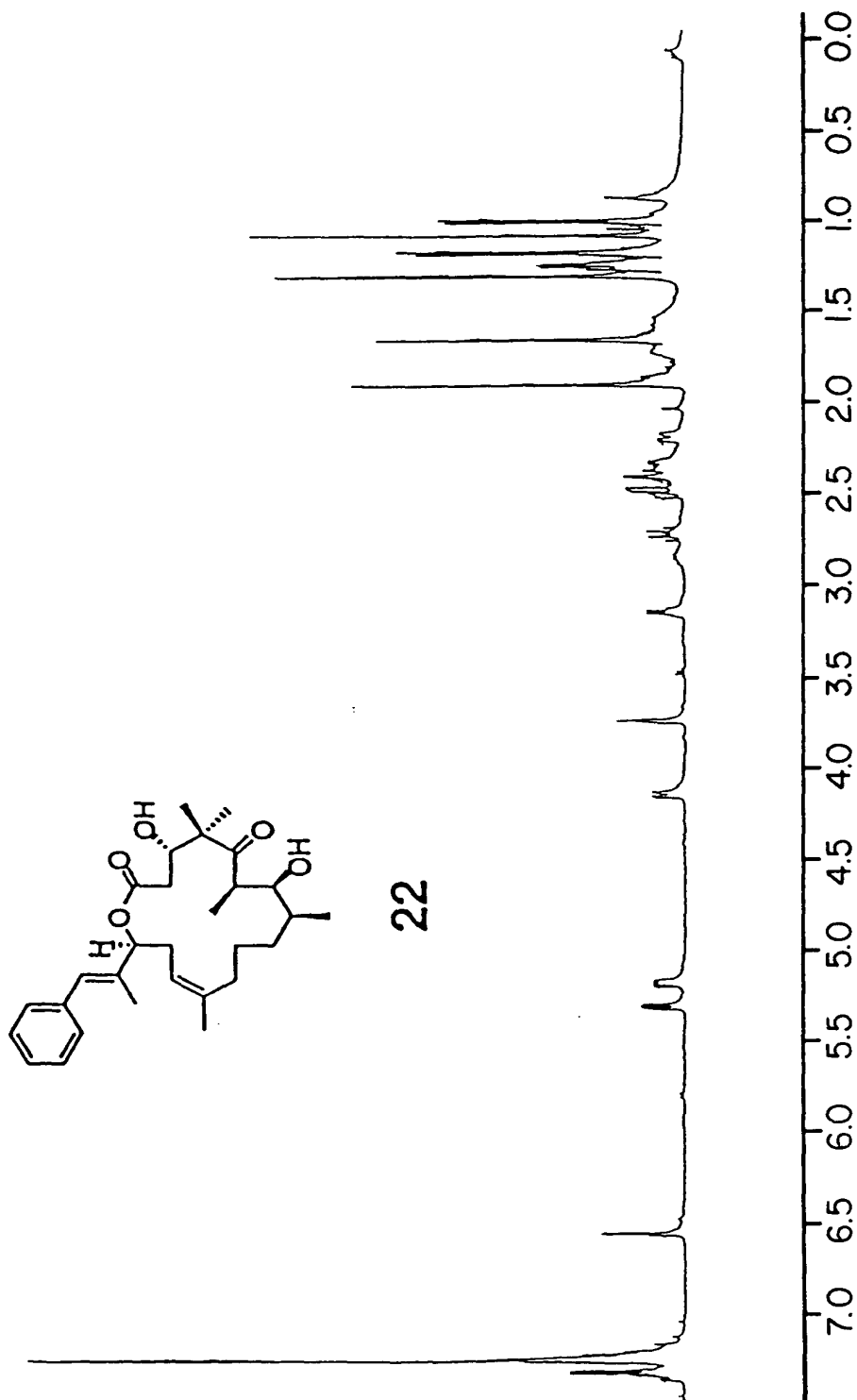
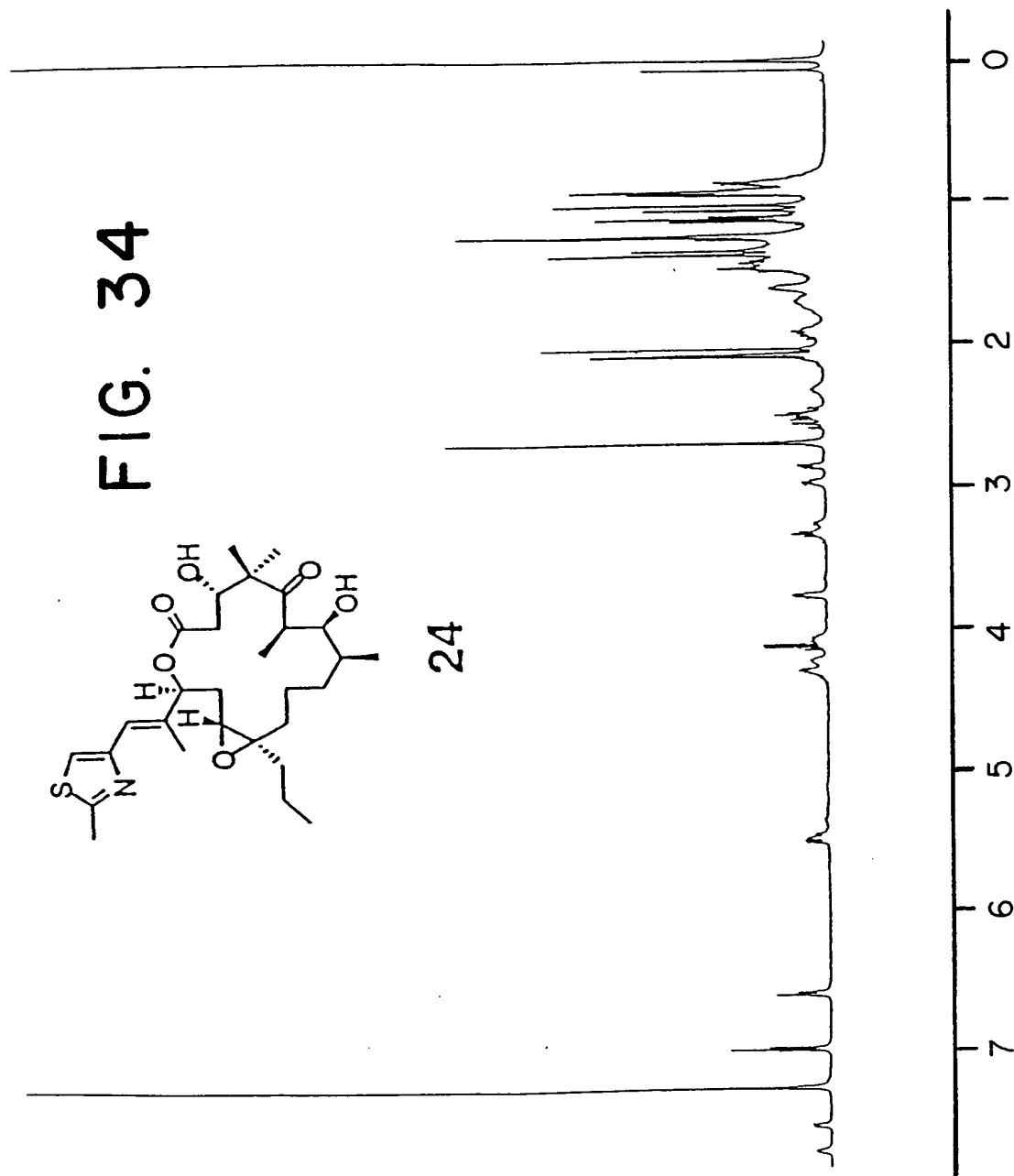


FIG. 33





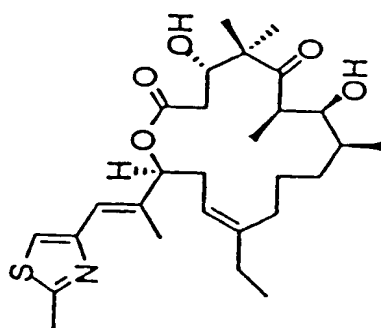
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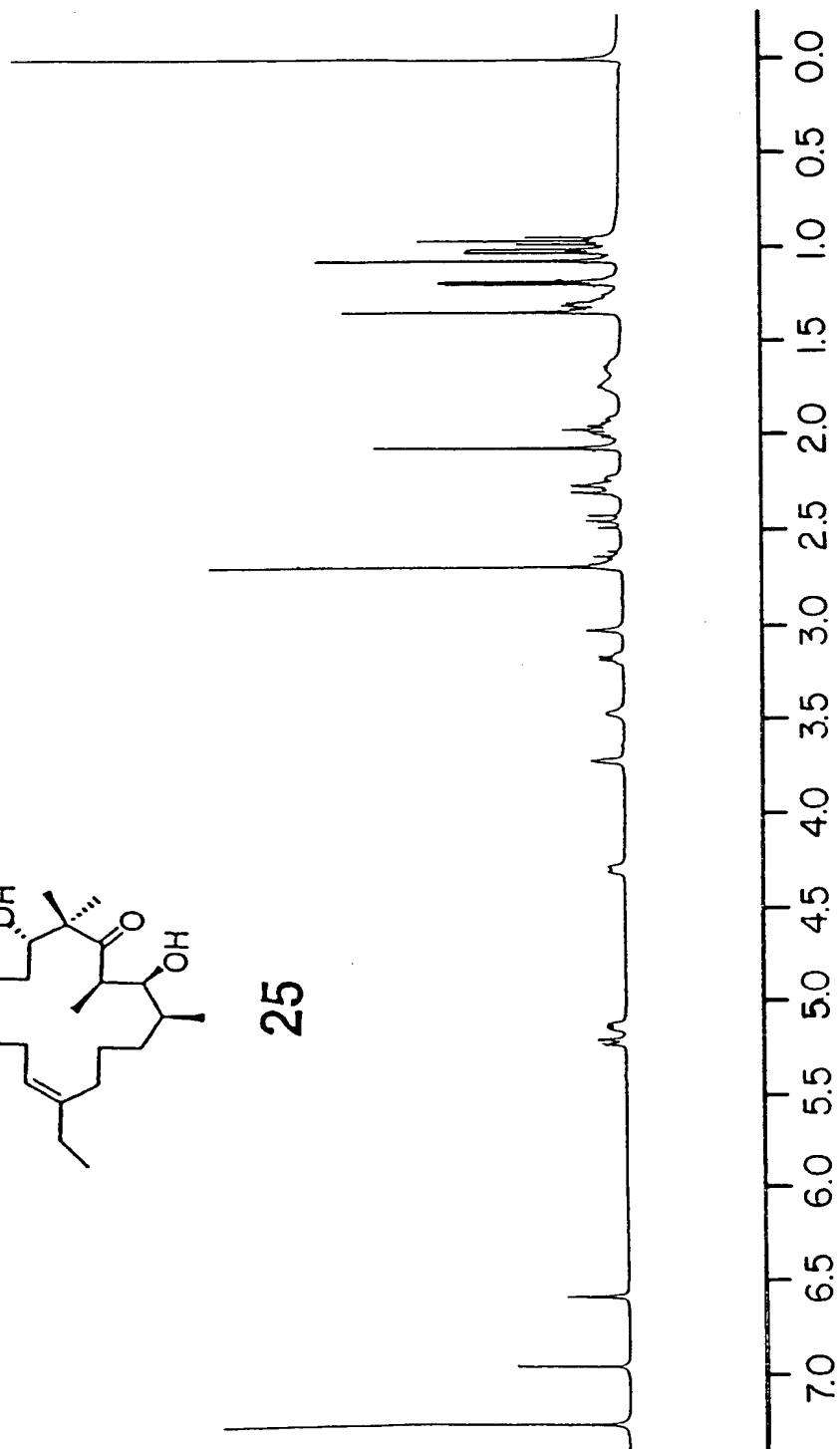


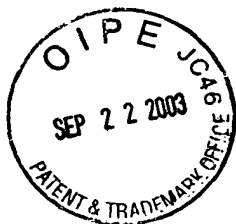
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FIG. 35



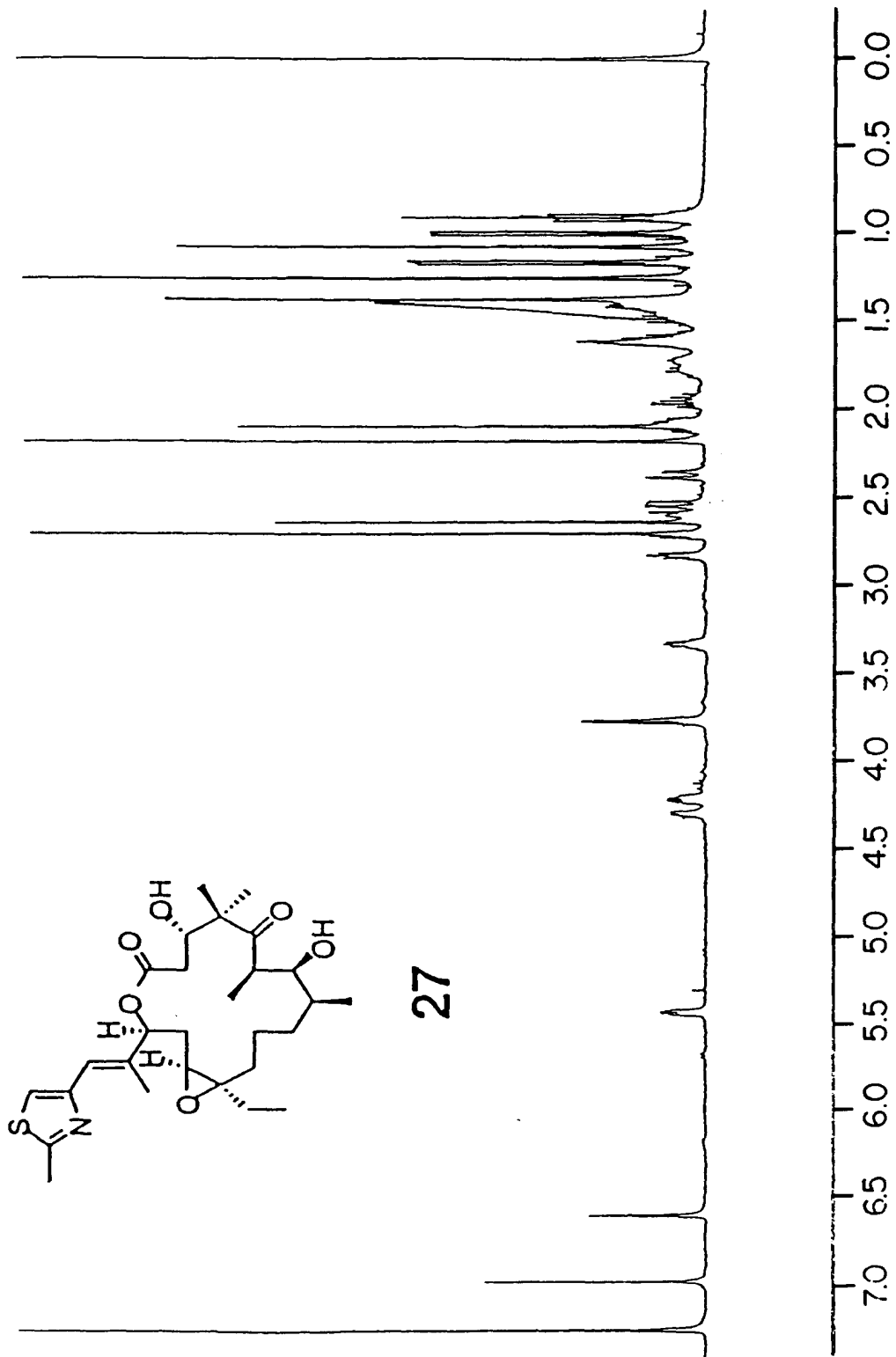
25





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FIG. 37



27



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FIG. 38

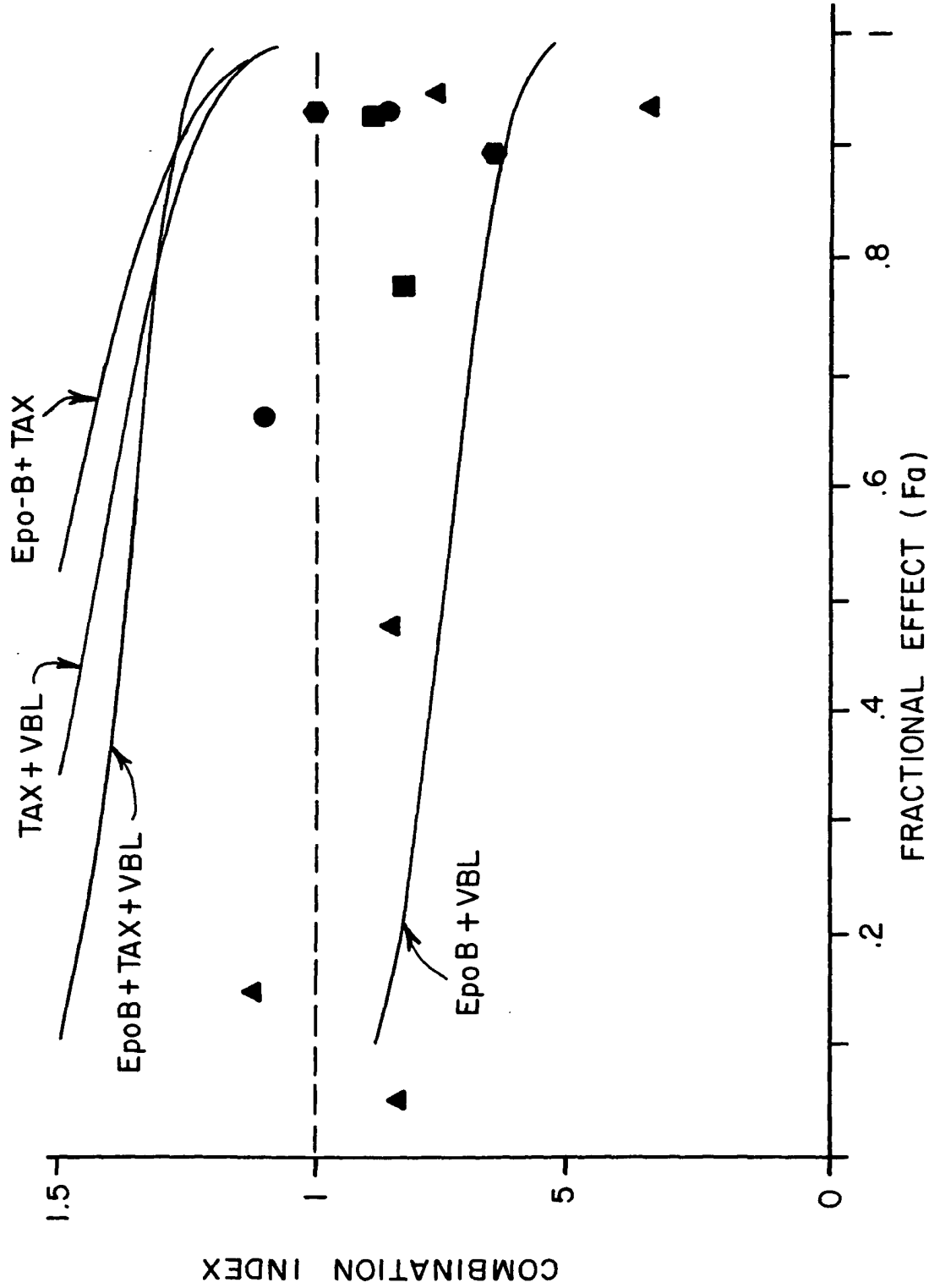
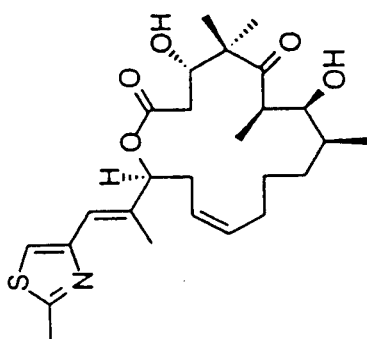
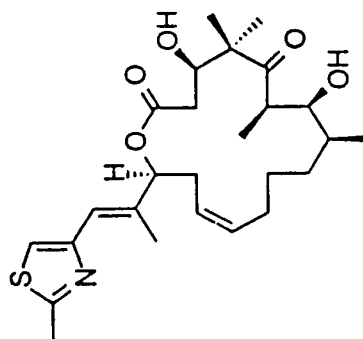


FIG. 39A

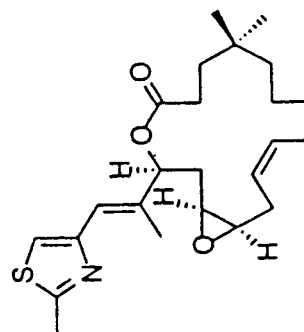


desoxyepothilone A

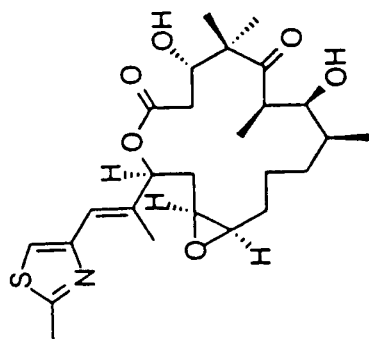
1
(0.022)
[0.012]



4
(2.12)
[43.0]

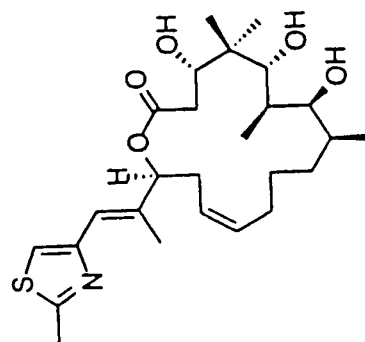


3
(271.1)
[22.4]



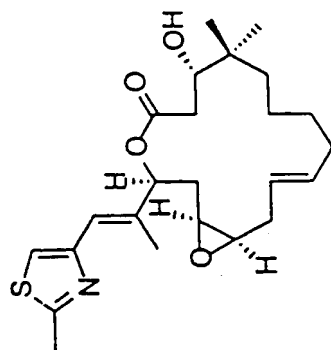
epothilone A

(0.0027)
[0.020]

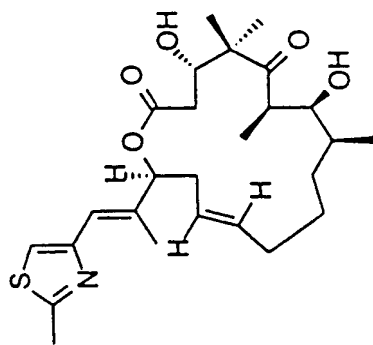


2
(14.23)
[6.28]

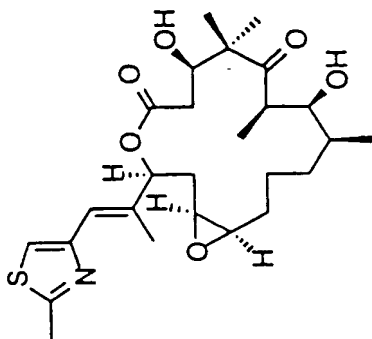
FIG. 39B



7
(7.36)
[9.82]

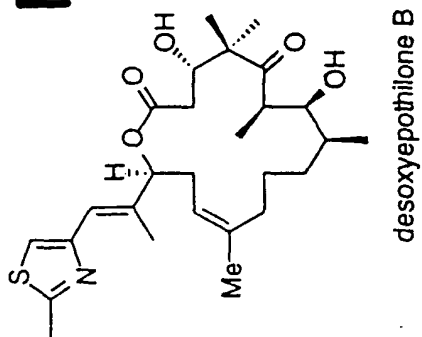


6
(0.052)
[0.035]

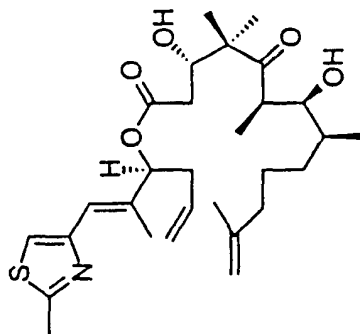


5
(>20)
[35.2]

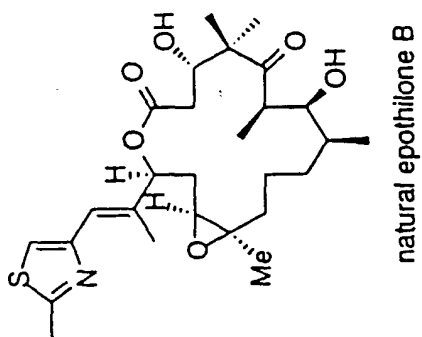
FIG. 40A



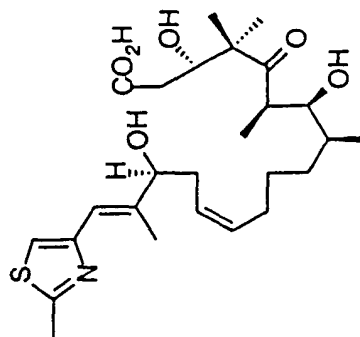
10
(0.0095)
[0.017]



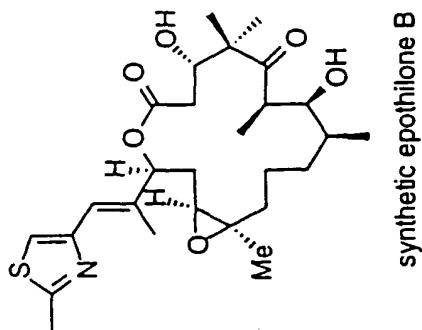
13
(11.53)
[5.63]



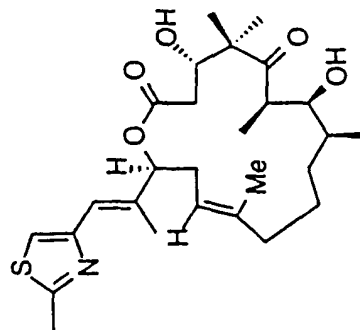
9
(0.00017)
[0.0012]



12
(0.79)
[>5]

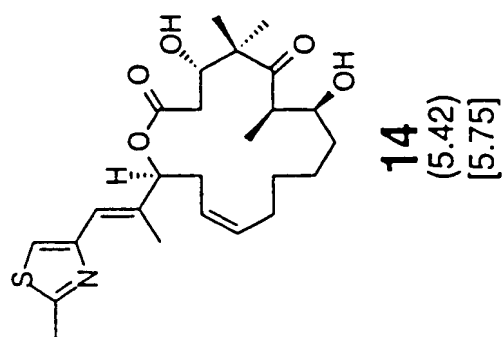
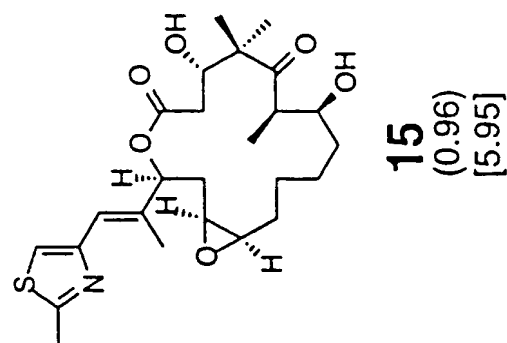
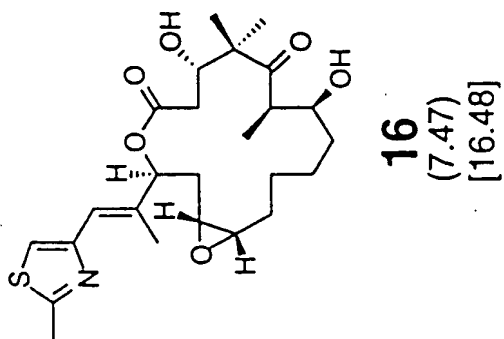


8
(0.00044)
[0.0026]



11
(0.090)
[0.262]

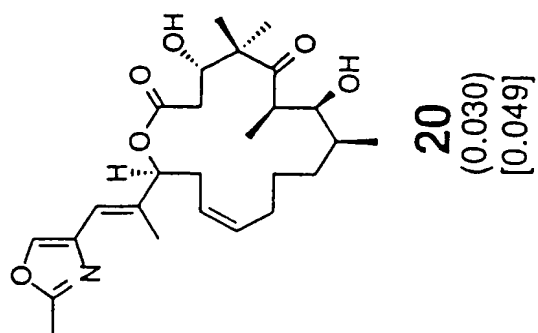
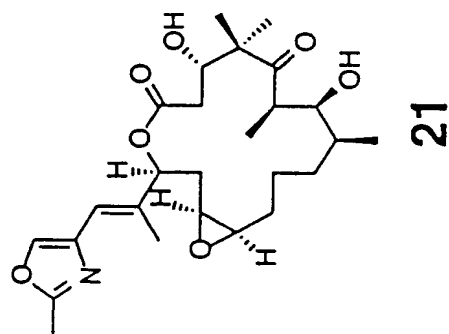
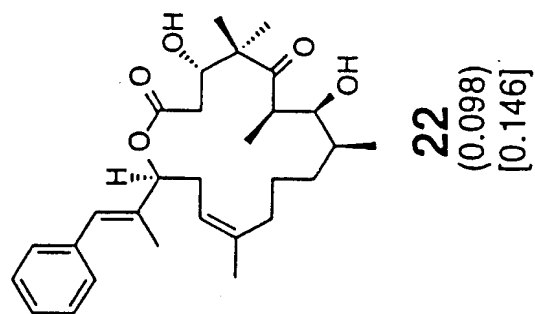
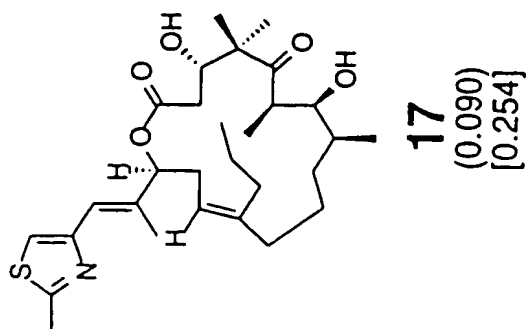
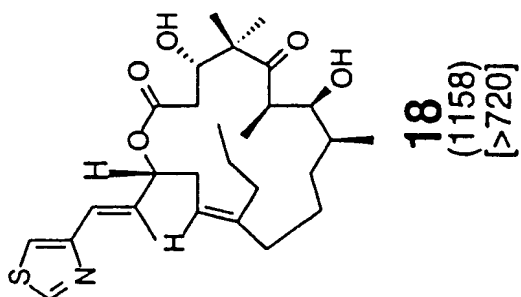
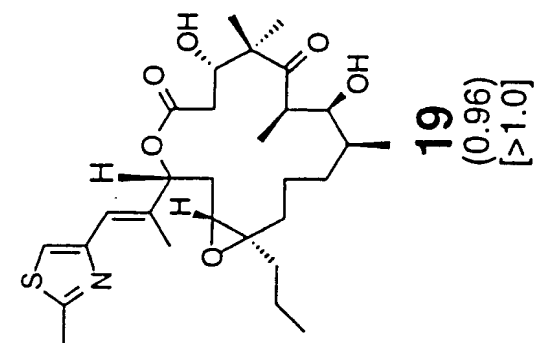
FIG. 40B





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FIG. 41A





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FIG. 41B

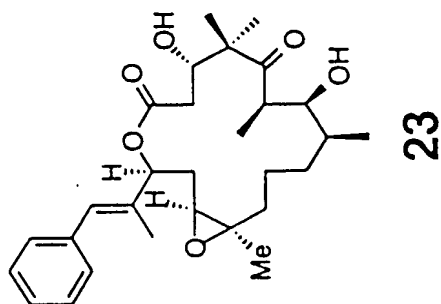
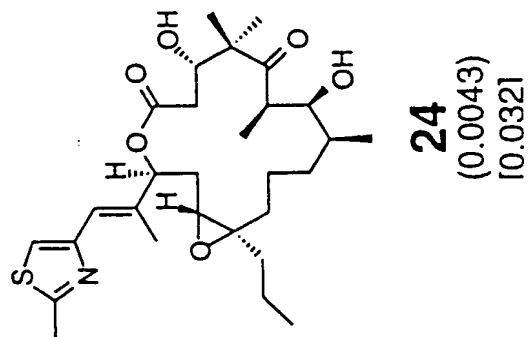
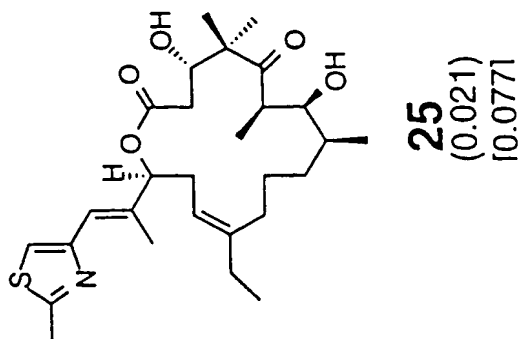
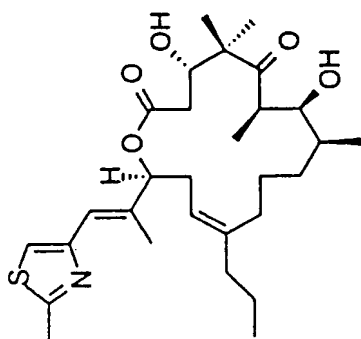
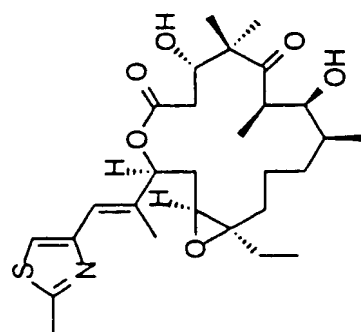


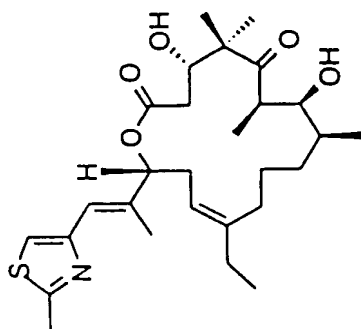
FIG. 42A



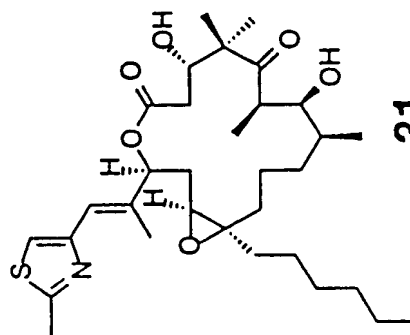
28
(0.039)
[0.067]



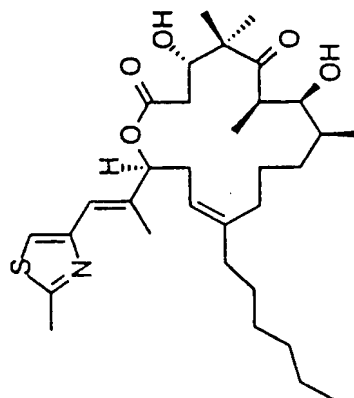
27
(0.0010)
[0.0072]



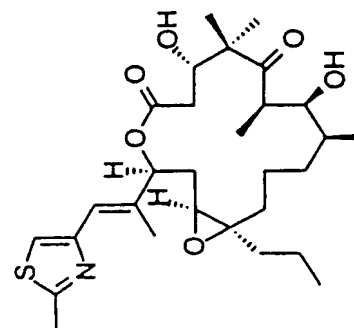
26
(0.055)
[0.197]



31
(0.027)
[0.049]

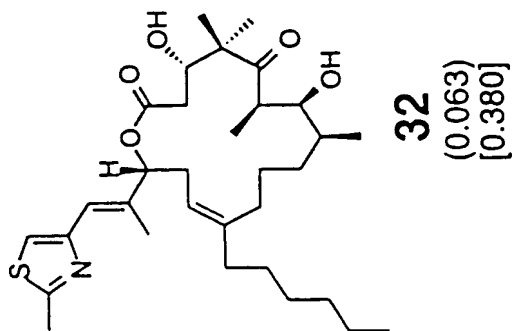
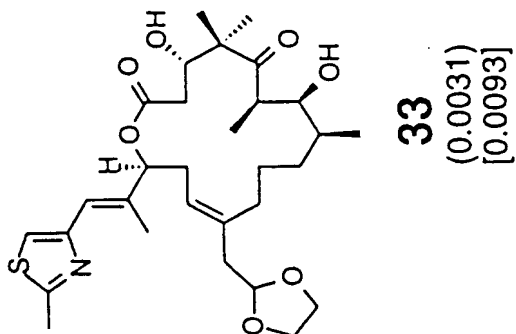
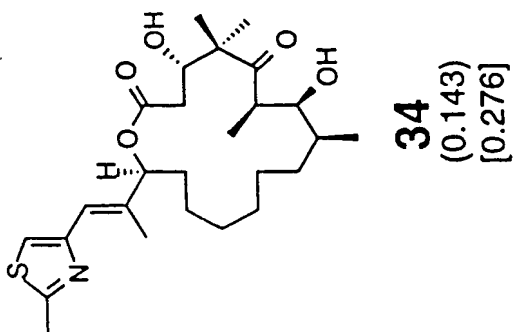


30
(0.044)
[0.108]



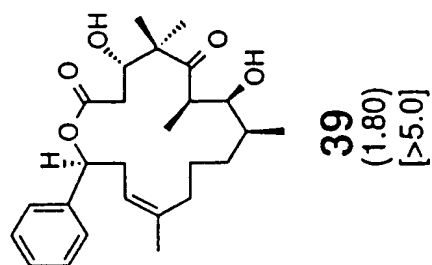
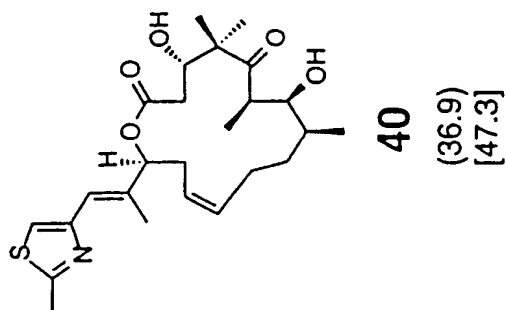
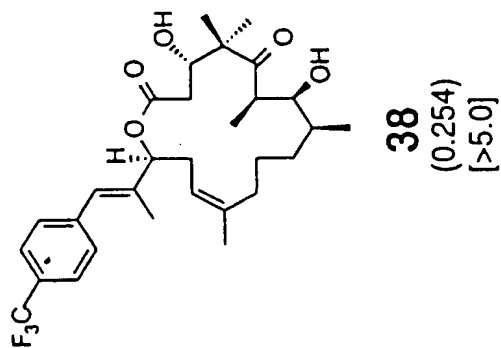
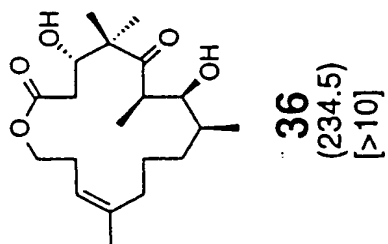
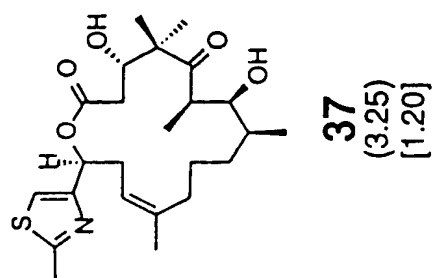
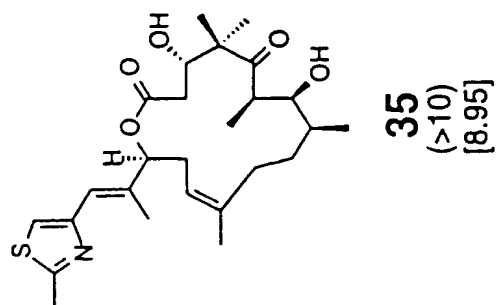
29
(0.0038)
[0.0064]

FIG. 42B



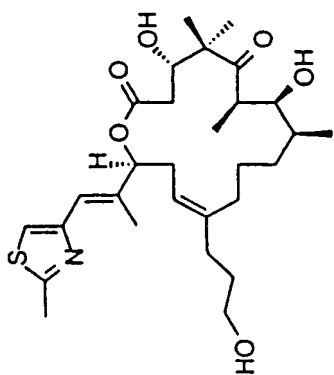
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FIG. 42C

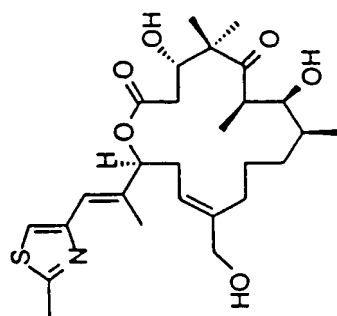


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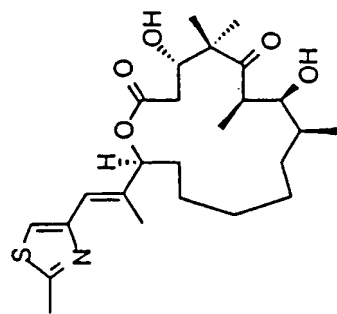
FIG. 42D



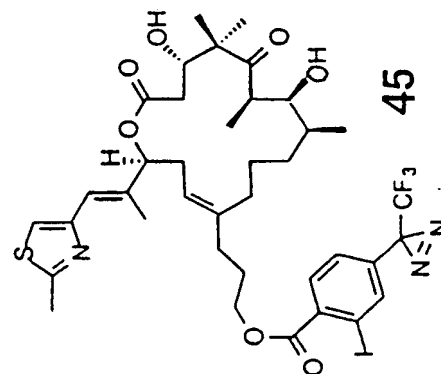
43
 (0.0095)
 [0.167]



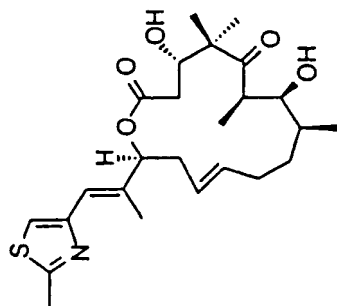
46 (0.049)
 [>1.0]



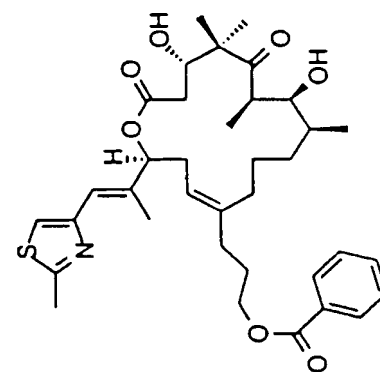
42
 (7.41)
 [12.9]



45



41
 (60.1)
 [59.2]

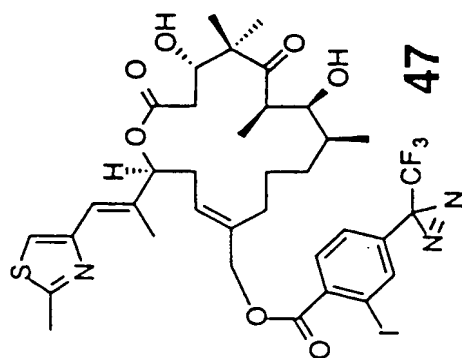
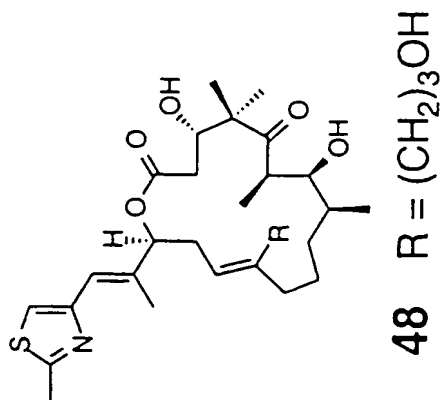
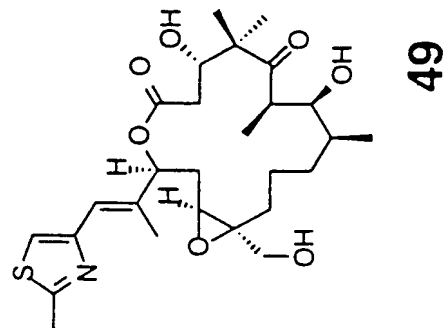


44 (0.250)
 [0.905]



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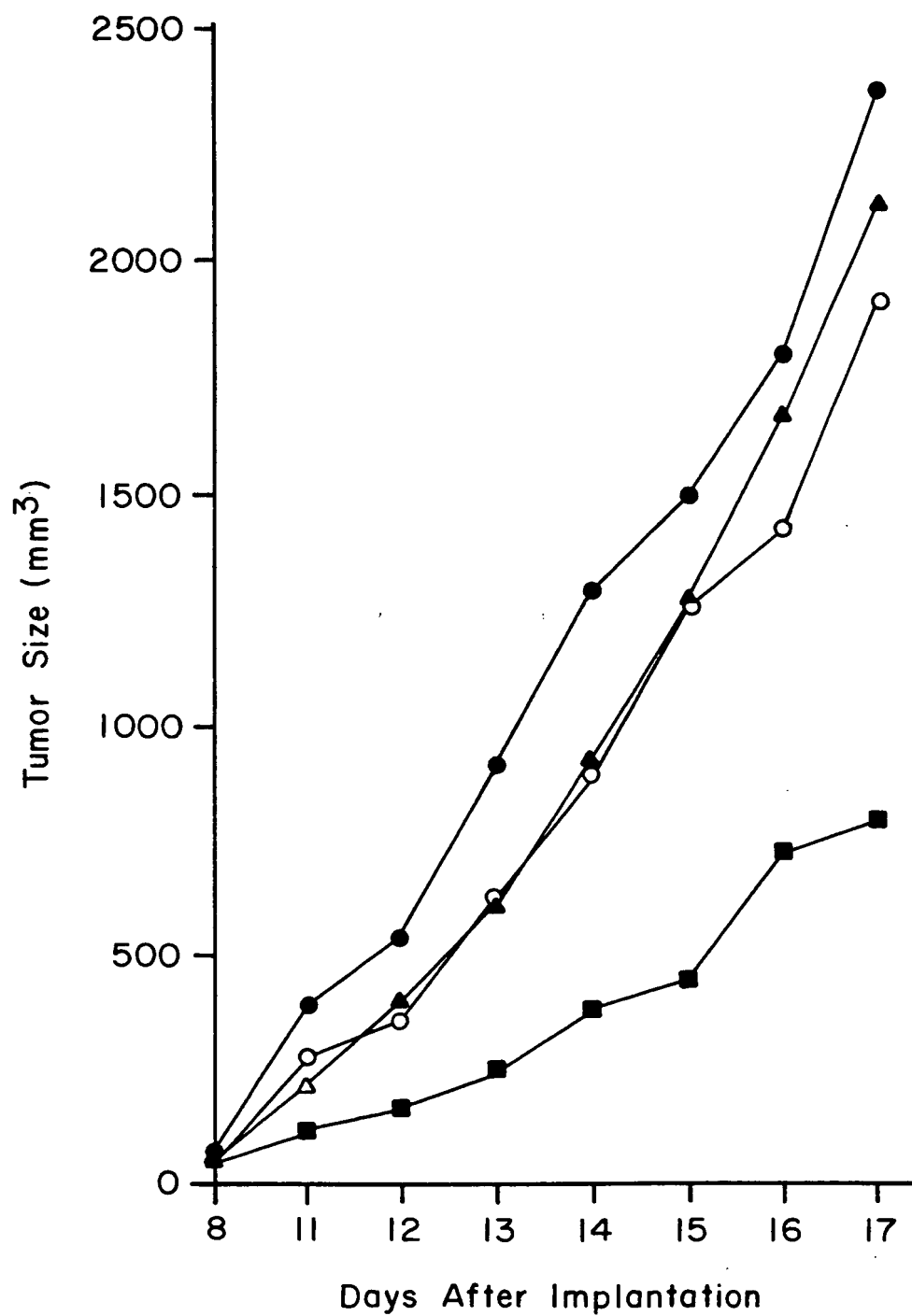
FIG. 42E





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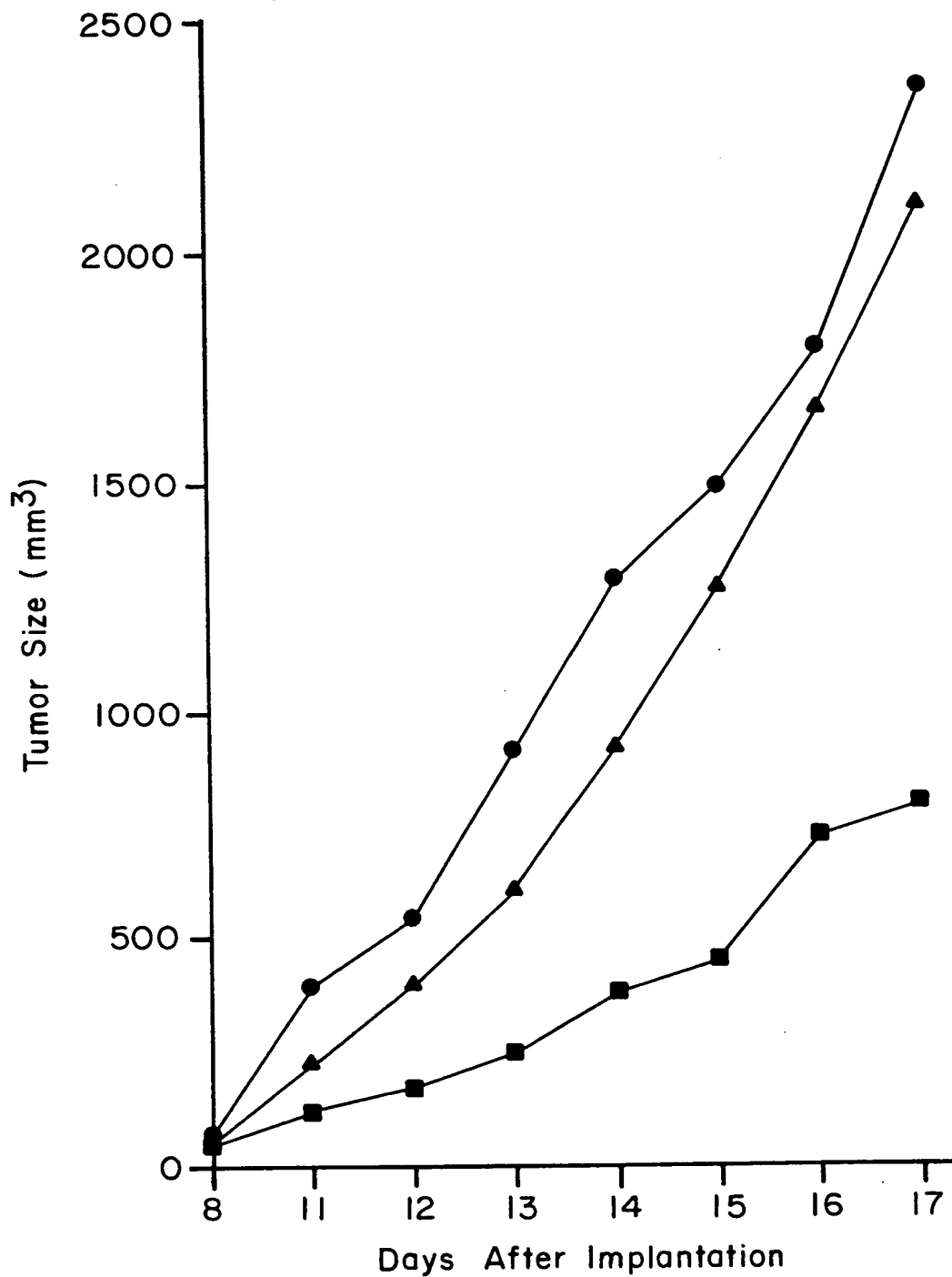
FIG. 43A





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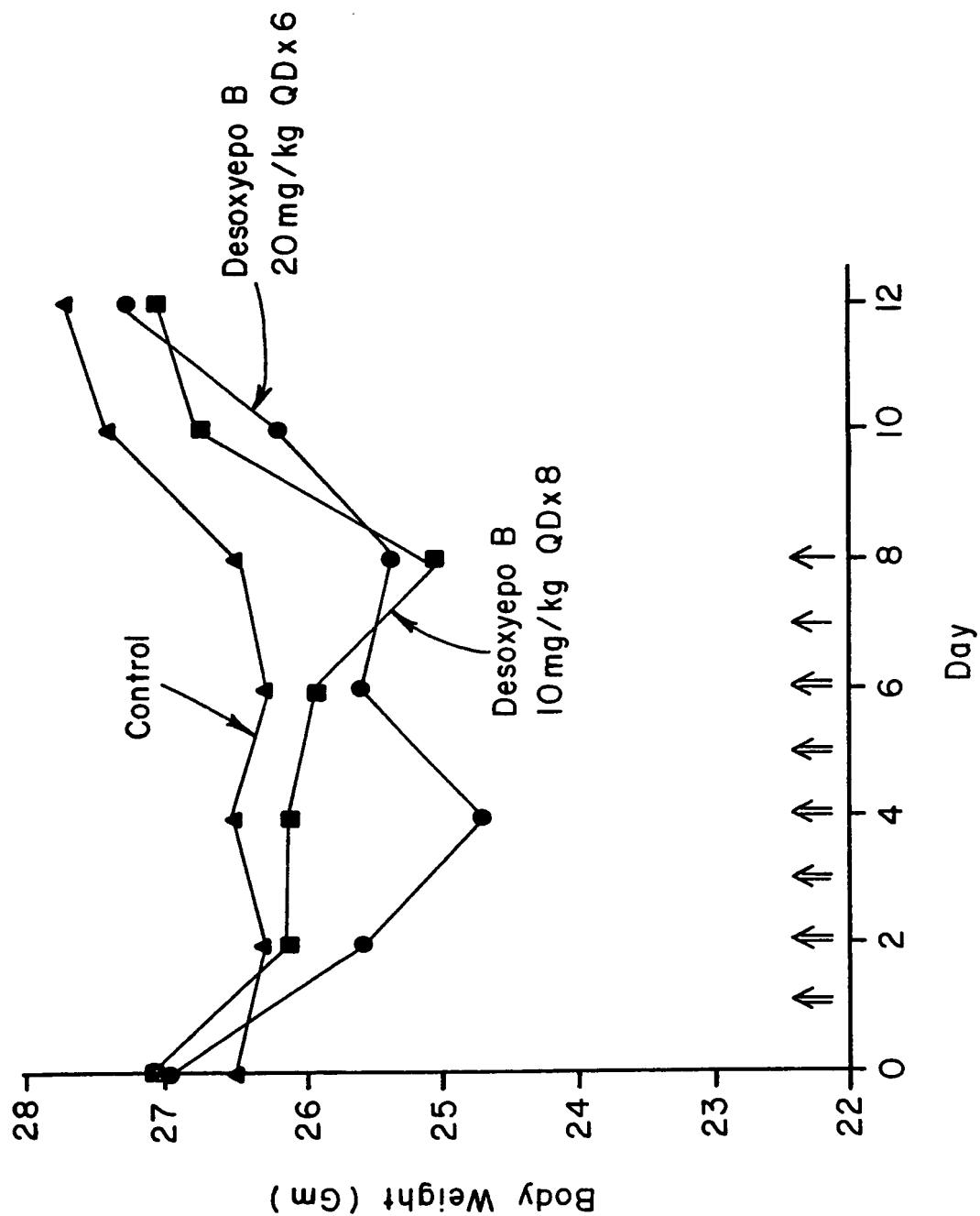
FIG. 43 B

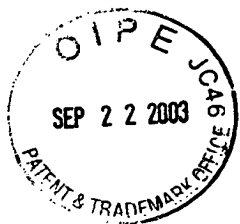




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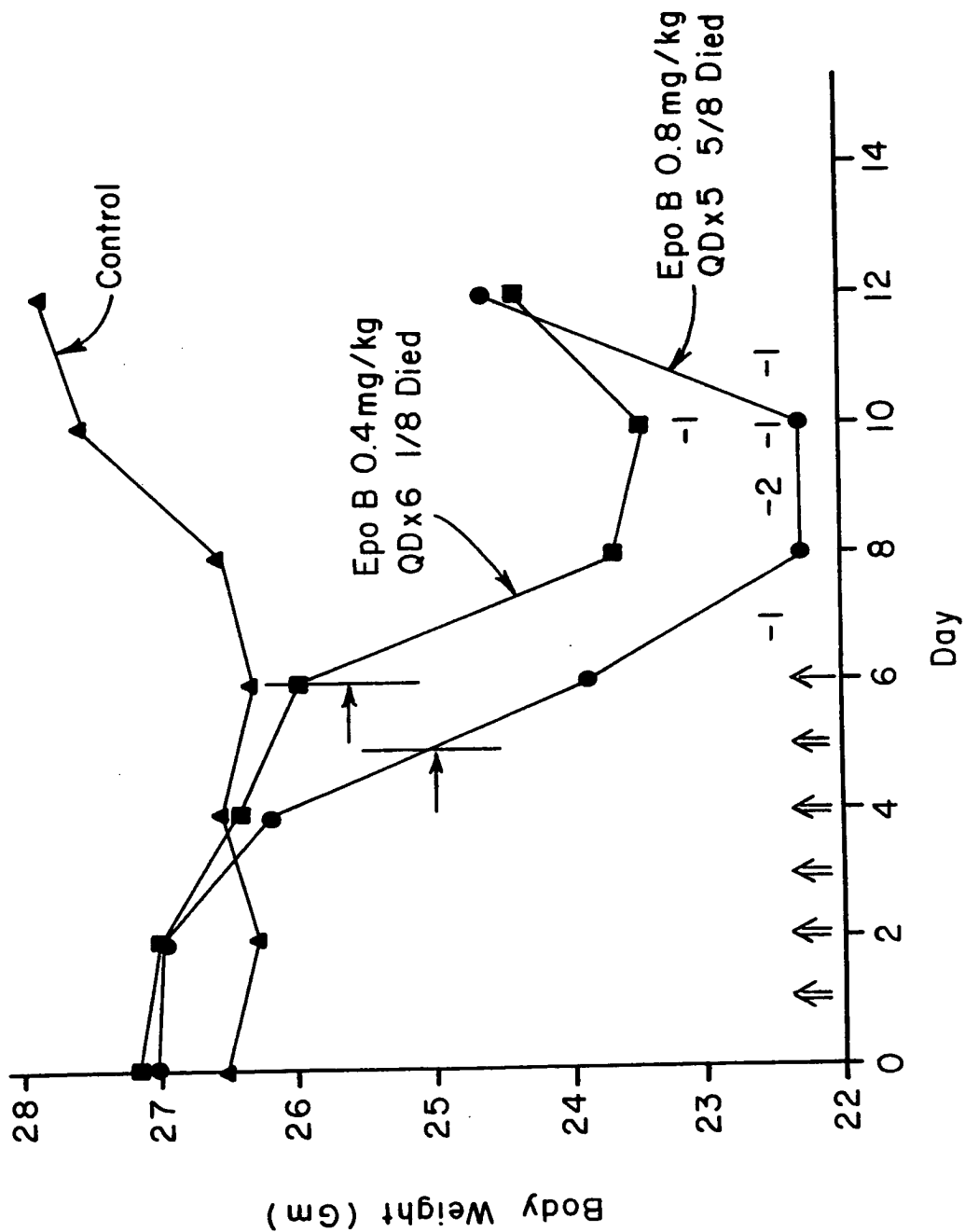
FIG. 44A





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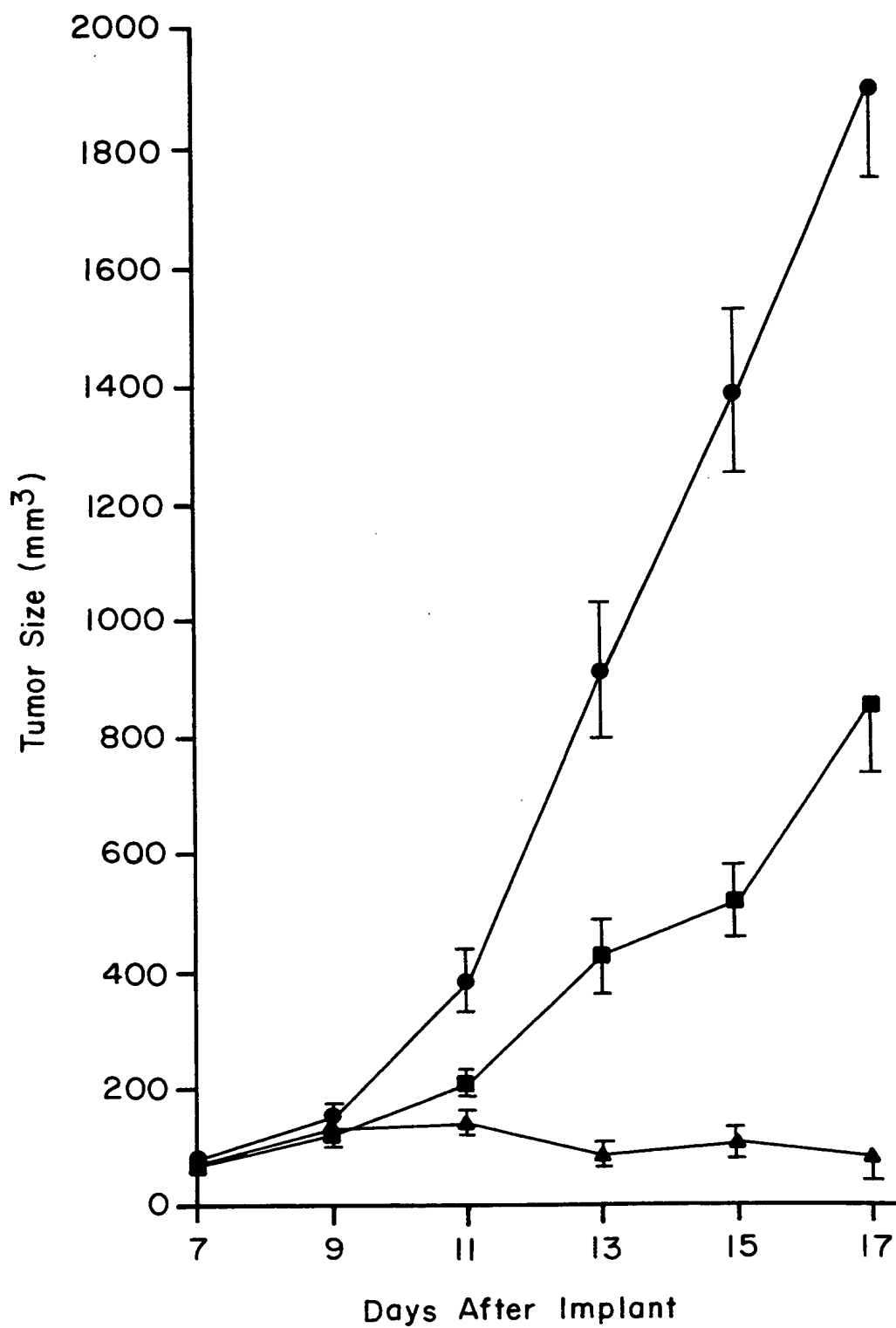
FIG. 44B





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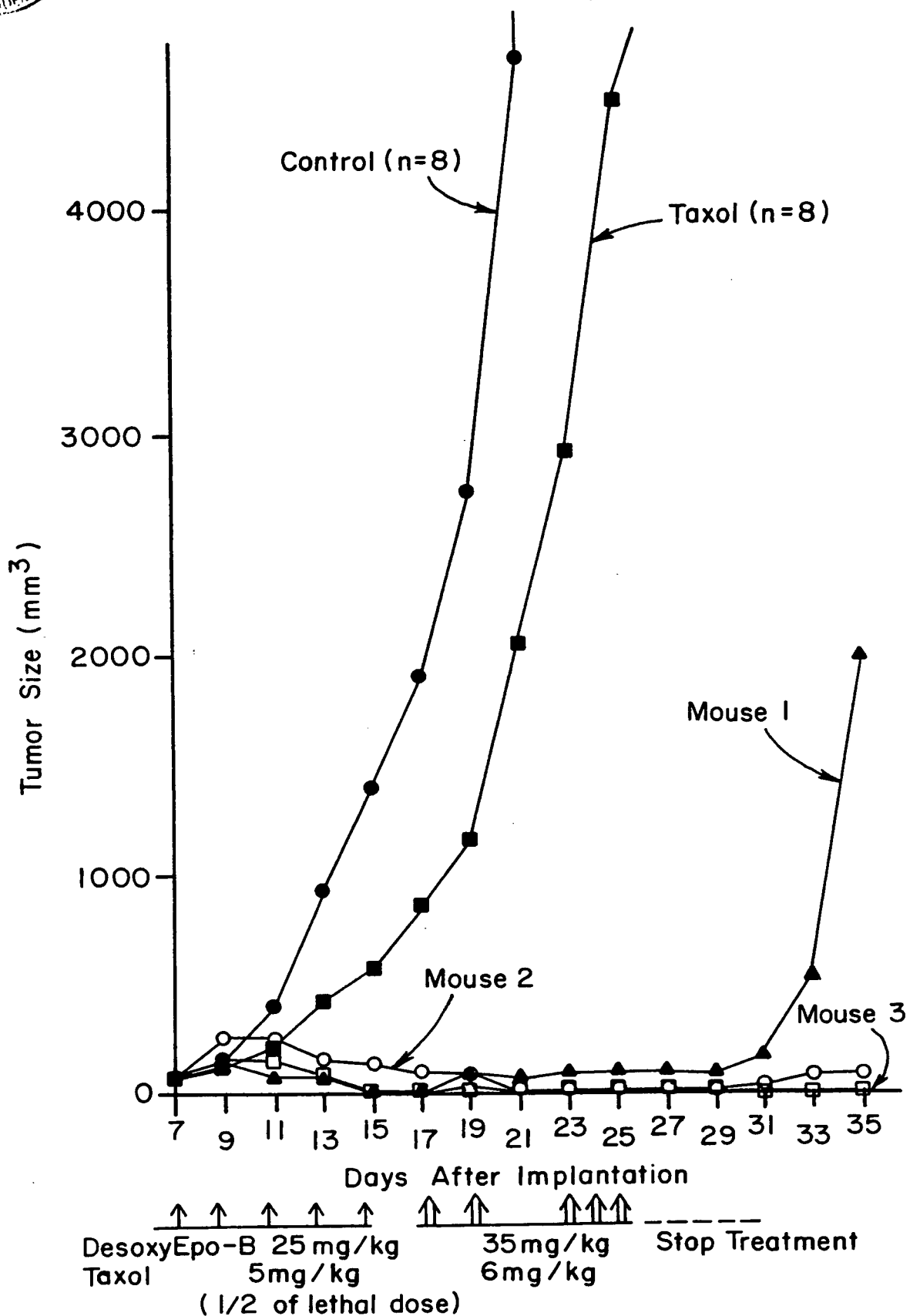
FIG. 45A

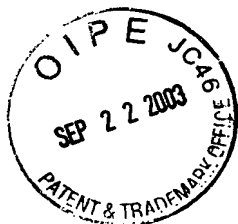




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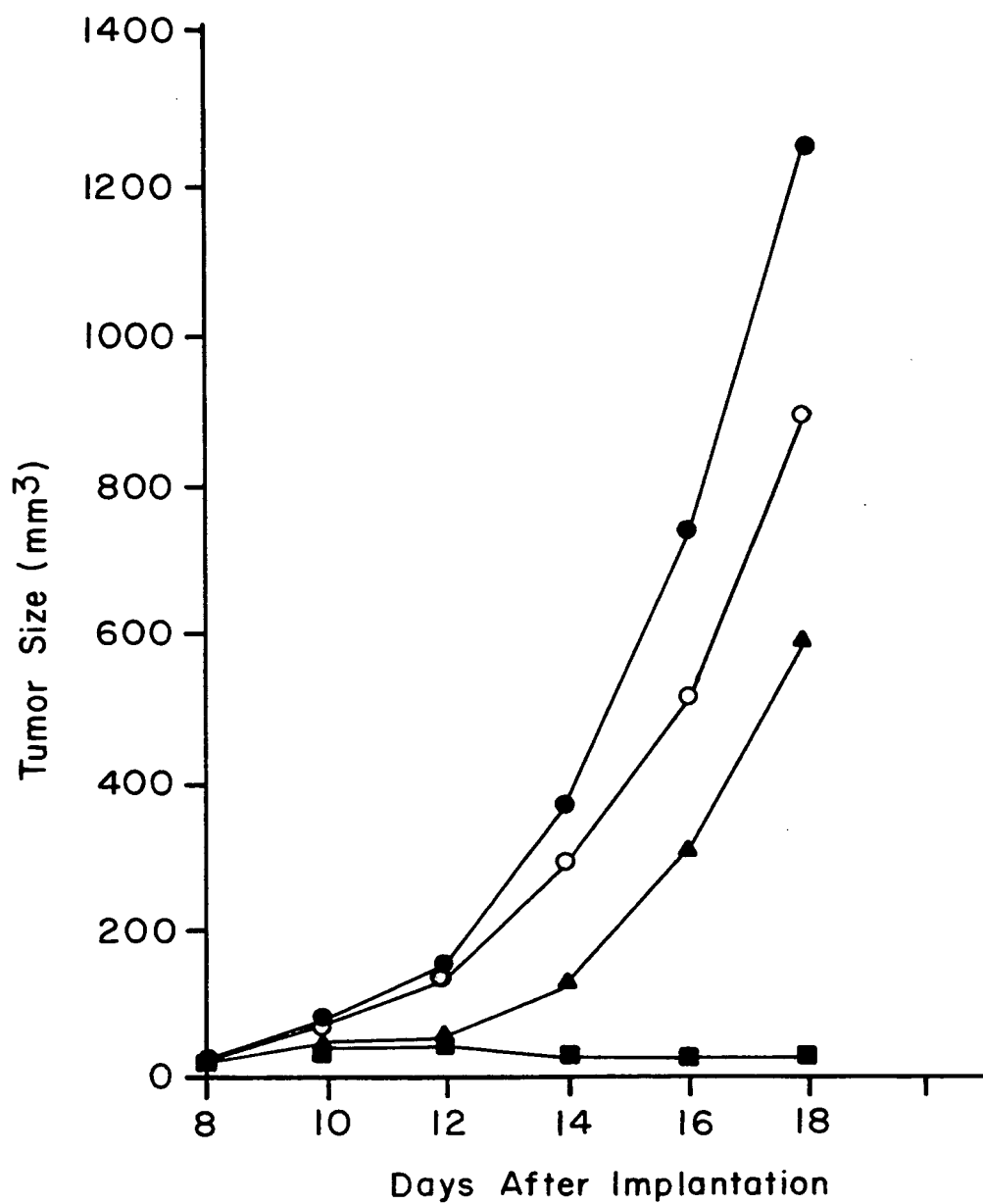
FIG. 45 B





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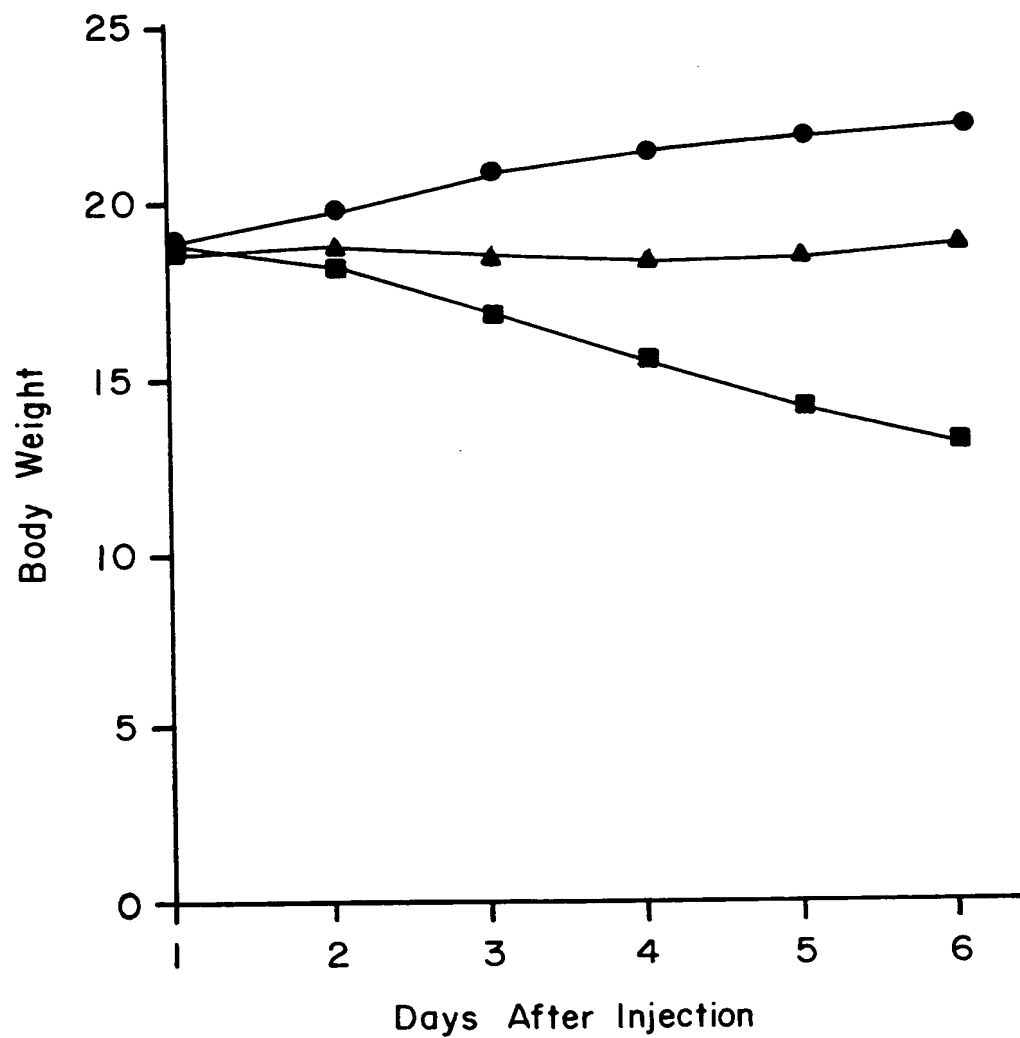
FIG. 46





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FIG. 47



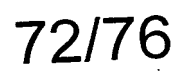
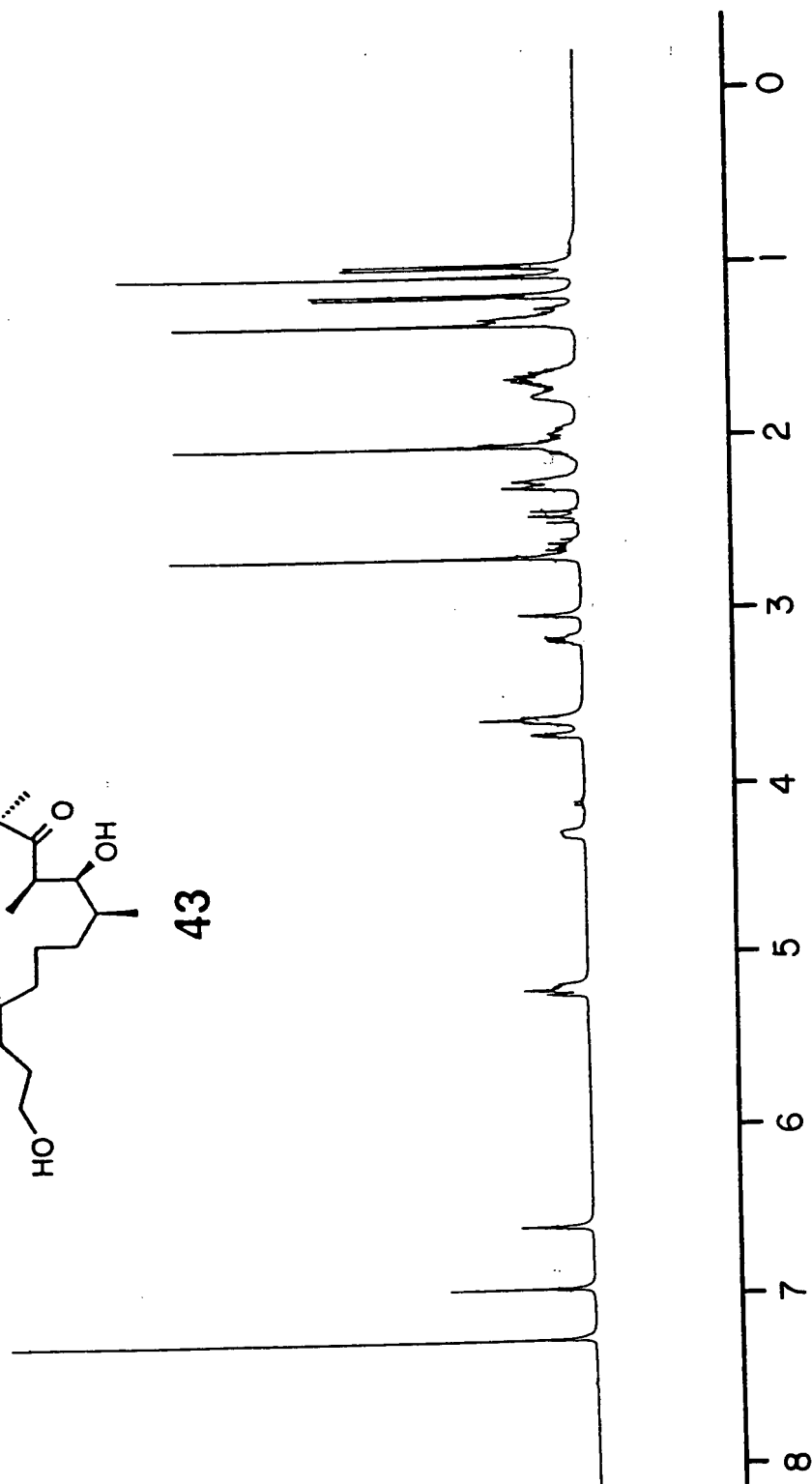
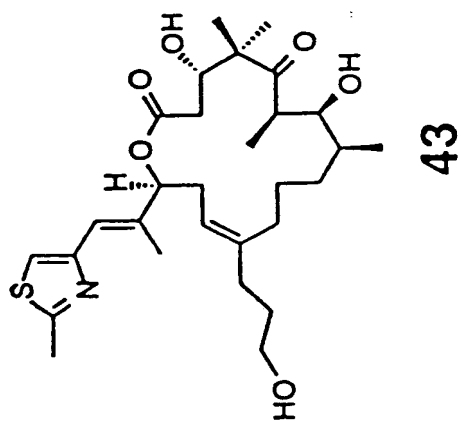
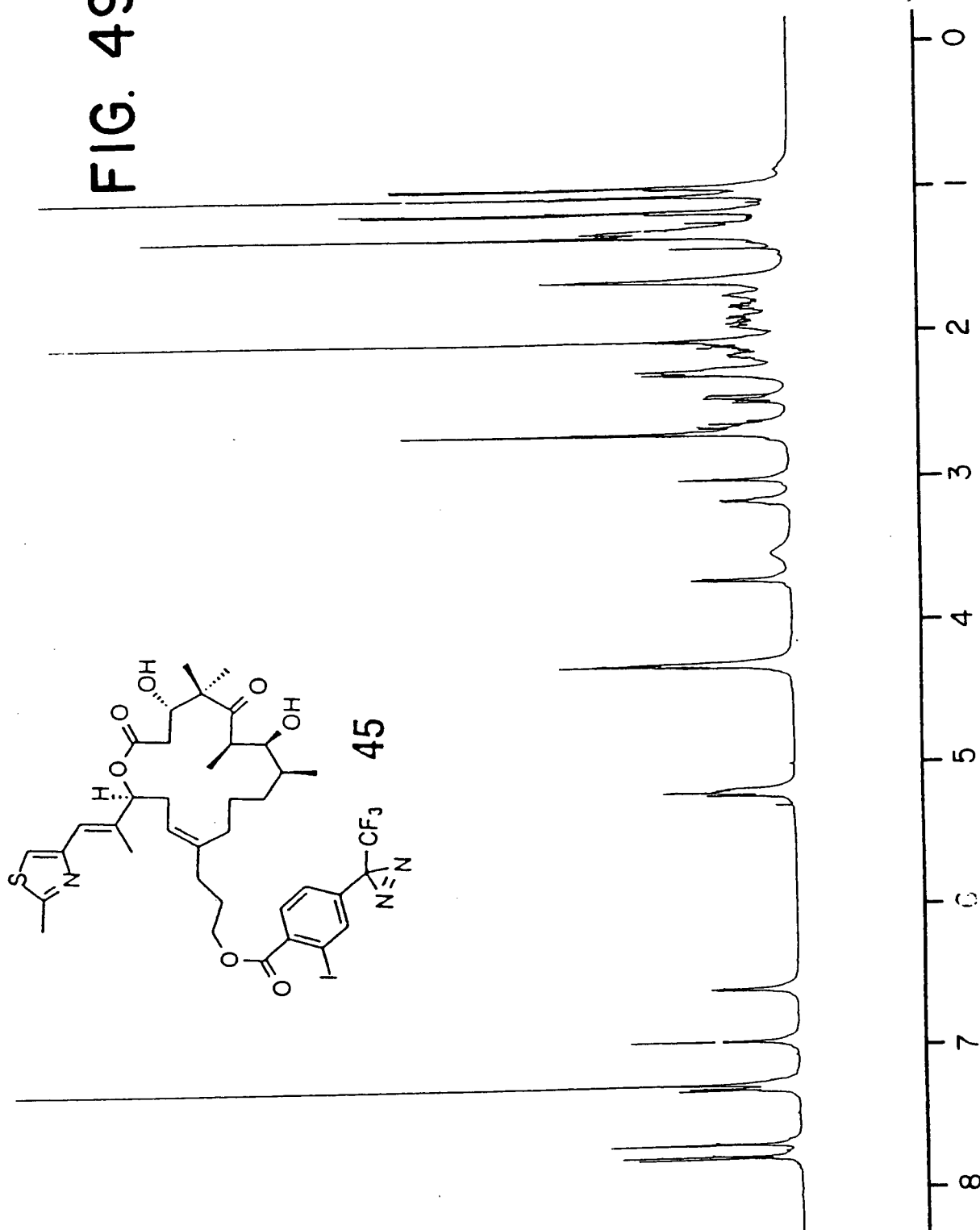


FIG. 48



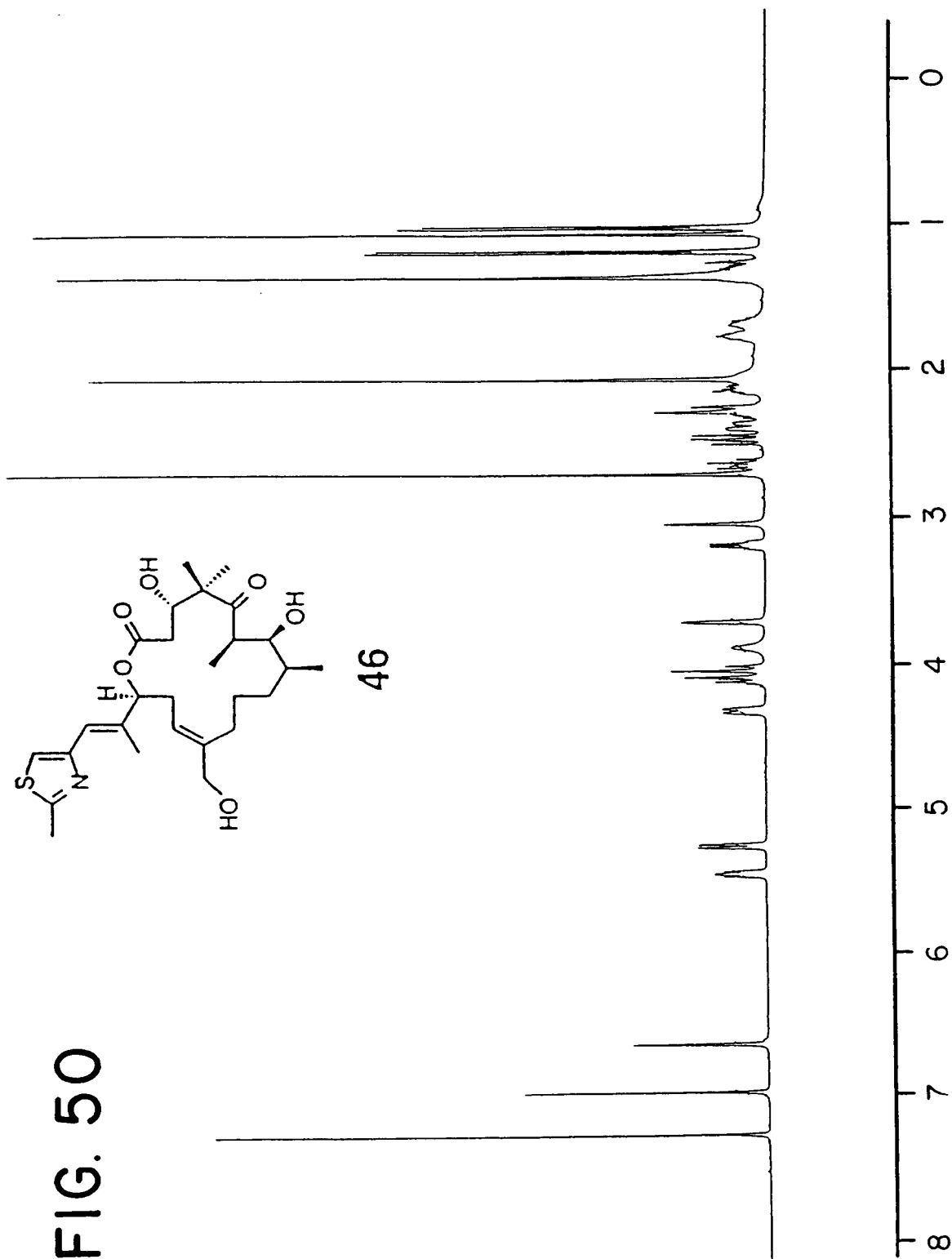
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FIG. 49





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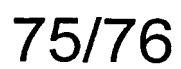
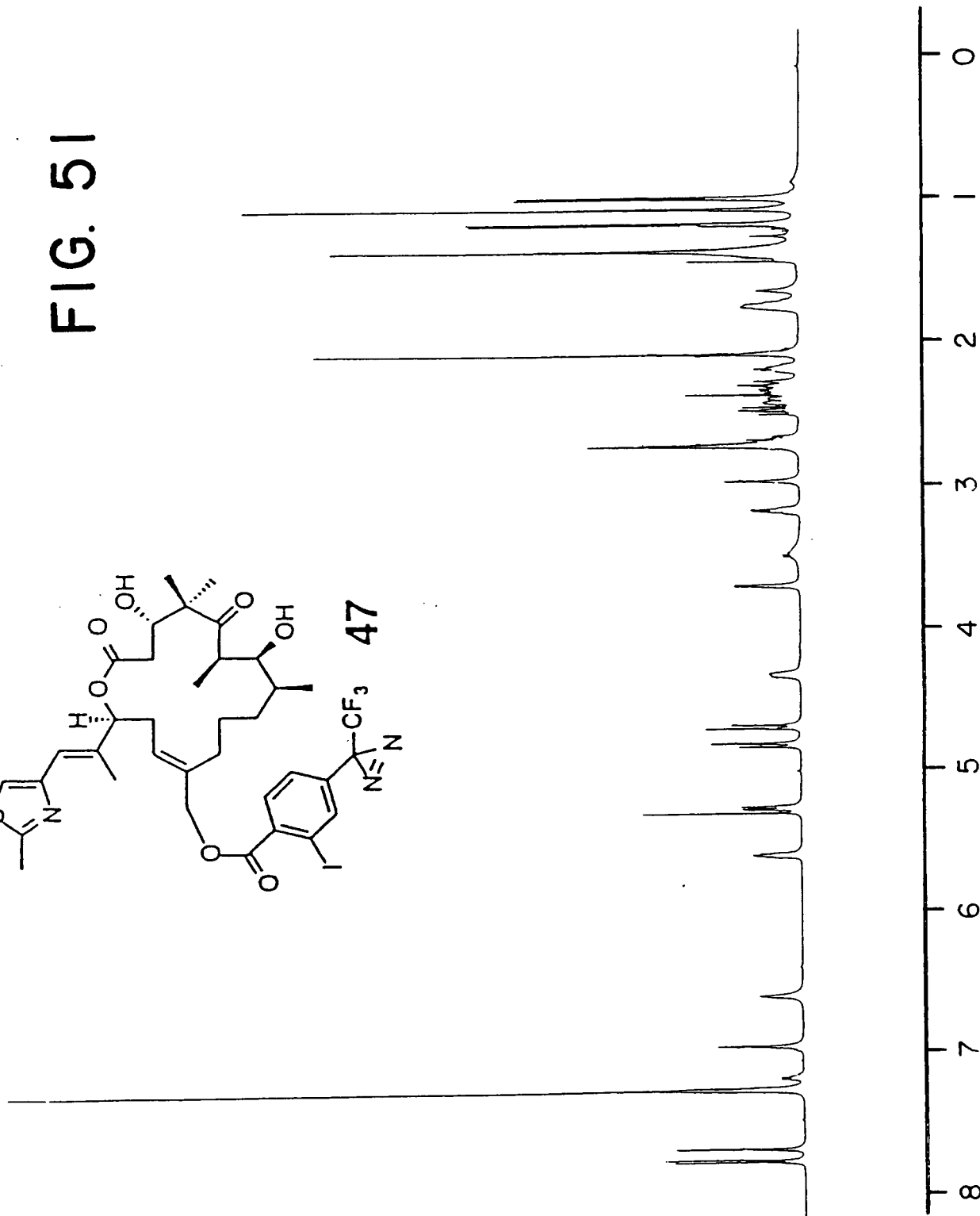
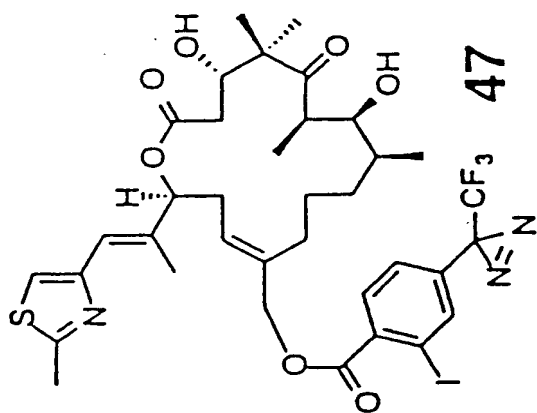


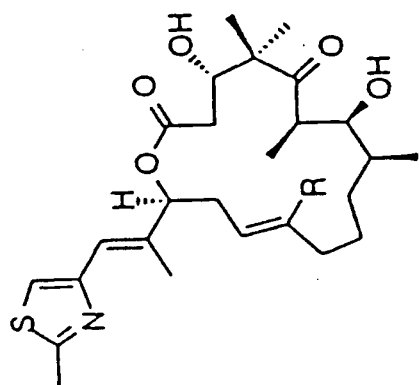
FIG. 15





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FIG. 52



48 R = (CH₂)₃OH

